

# Industry & Trade Summary

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## Broadwoven Fabrics

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USITC Publication 3410  
March 2001

OFFICE OF INDUSTRIES  
U.S. International Trade Commission  
Washington, DC 20436



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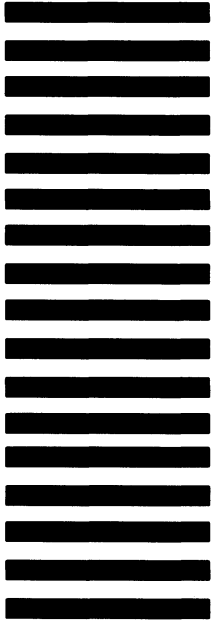
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# PREFACE

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In 1991 the United States International Trade Commission initiated its current *Industry and Trade Summary* series of informational reports on the thousands of products imported into and exported from the United States. Each summary addresses a different commodity/industry area and contains information on product uses, U.S. and foreign producers, and customs treatment. Also included is an analysis of the basic factors affecting trends in consumption, production, and trade of the commodity, as well as those bearing on the competitiveness of U.S. industries in domestic and foreign markets.<sup>1</sup>

This report on Broadwoven Fabrics covers the period 1994 through 1999. Listed below are the individual summary reports published to date on the energy, chemicals, and textiles sectors.

<i>USITC publication number</i>	<i>Publication date</i>	<i>Title</i>
<b>Energy and Chemicals:</b>		
2458	November 1991 .....	Soaps, Detergents, and Surface-Active Agents
2509	May 1992 .....	Inorganic Acids
2548	August 1992 .....	Paints, Inks, and Related Items
2578	November 1992 .....	Crude Petroleum
2588	December 1992 .....	Major Primary Olefins
2590	February 1993 .....	Polyethylene Resins in Primary Forms
2598	March 1993 .....	Perfumes, Cosmetics, and Toiletries
2736	February 1994 .....	Antibiotics
2739	February 1994 .....	Pneumatic Tires and Tubes
2741	February 1994 .....	Natural Rubber
2743	February 1994 .....	Saturated Polyesters in Primary Forms
2747	March 1994 .....	Fatty Chemicals
2750	March 1994 .....	Pesticide Products and Formulations
2823	October 1994 .....	Primary Aromatics

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<sup>1</sup> The information and analysis provided in this report are for the purpose of this report only. Nothing in this report should be construed to indicate how the Commission would find in an investigation conducted under statutory authority covering the same or similar subject matter. i

# PREFACE—Continued

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<i>USITC publication number</i>	<i>Publication date</i>	<i>Title</i>
<b>Energy and Chemicals--Continued:</b>		
2826	November 1994 .....	Polypropylene Resins in Primary Forms
2845	March 1995 .....	Polyvinyl Chloride Resins in Primary Forms
2846	December 1994 .....	Medicinal Chemicals, except Antibiotics
2866	March 1995 .....	Hose, Belting, and Plastic Pipe
2943	December 1995 .....	Uranium and Nuclear Fuel
2945	January 1996 .....	Coal, Coke, and Related Chemical Products
3014	February 1997 .....	Synthetic Rubber
3021	February 1997 .....	Synthetic Organic Pigments
3081	March 1998 .....	Explosives, Propellant Powders, and Related Items
3082	March 1998 .....	Fertilizers
3093	March 1998 .....	Adhesives, Glues, and Gelatin
3147	December 1998 .....	Refined Petroleum Products
3162	March 1999 .....	Flavor and Fragrance Materials

## **Textiles and apparel:**

2543	August 1992 .....	Nonwoven Fabrics
2580	December 1992 .....	Gloves
2642	June 1993 .....	Yarn
2695	November 1993 .....	Carpets and Rugs
2702	November 1993 .....	Fur Goods
2703	November 1993 .....	Coated Fabrics
2735	February 1994 .....	Knit Fabric
2841	December 1994 .....	Cordage
2853	January 1995 .....	Apparel
2874	April 1995 .....	Manmade Fibers
3169	March 1999 .....	Apparel
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# ABSTRACT

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This report examines trade and industry conditions for broadwoven fabrics, the materials from which most textile and apparel articles are made, for the period 1994-99.

- The global broadwoven fabric industry continued to undergo significant restructuring as a result of keen competition in global markets. Competition has intensified in recent years, in part because of heavy pricing pressures from Asia in the aftermath of the 1997-98 Asian financial crisis. Asia is the world's largest exporter of broadwoven fabrics. World trade in textiles and apparel will become less restrictive as World Trade Organization countries eliminate quotas on such goods by 2005, adding to the competitive pressures facing the global industry.
- The U.S. broadwoven fabric industry declined according to several measures during 1994-99, a period of strong U.S. economic growth. Employment fell by 19 percent to 182,000 workers. Industry shipments rose from an average of \$24.5 billion per year during 1994-96 to \$25.0 billion in 1997, and then fell to \$23.0 billion in 1999.
- The U.S. market, valued at \$21 billion in 1999, showed little growth during 1994-99. Imports rose from \$3.4 billion in 1994 to \$3.9 billion in 1997 and 1998, and then fell to \$3.6 billion in 1999. Imports supplied 17 percent of the U.S. market by quantity in 1999 and came primarily from Asia. The U.S. industry faces shrinking U.S. production of apparel, its major market. The growth in U.S. apparel imports, which account for about 60 percent of the U.S. apparel market, limits domestic demand for U.S. fabrics when such imports substitute foreign cloth for domestic fabrics. Although a significant share of the apparel imports come from Caribbean countries and Mexico, which use large quantities of U.S. fabrics, the majority come from other countries, especially Asian countries, which seldom use U.S. materials.
- In response to difficult market conditions and ongoing trade liberalization, the U.S. industry restructured and consolidated operations during the 1990s, reducing its production of basic apparel fabrics and expanding output of higher value-added fabrics. The industry also invested in new technologies to increase productivity, operating flexibility, and customer and market responsiveness. Since the implementation of the North American Free-Trade Agreement (NAFTA) in 1994, several U.S. fabric producers have invested in operations in Mexico to make apparel and fabrics for U.S. and Mexican customers.

## ABSTRACT—*Continued*

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- U.S. exports of broadwoven fabrics rose at an average annual rate of 7.5 percent during 1994-99 to \$2.6 billion, or 13 percent of U.S. shipments of such fabrics in 1999. Exports to Mexico have quadrupled under NAFTA, rising to \$1.2 billion, or 46 percent of total exports in 1999. New legislation expanding trade benefits for countries in sub-Saharan Africa and the Caribbean Basin will likely spur demand for U.S. exports of apparel fabrics.

# INTRODUCTION

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Woven fabrics are the most common fabrics in the world, reportedly accounting for about 70 to 75 percent of total fabric production by weight in the developed countries and even more in the developing countries.<sup>1</sup> This report covers “broadwoven fabrics,” which are defined for trade and tariff purposes as woven fabrics made in widths greater than 30 centimeters (i.e., greater than approximately 12 inches in width).<sup>2</sup> Broadwoven fabrics are the principal fabrics used in most textile and apparel articles.

This report examines developments in the broadwoven fabric industry during 1994-99. In this section is a brief overview of the principal types and end uses of broadwoven fabrics, along with their production processes and factors of production. Next is a discussion of the U.S. industry structure, performance, and key business strategies. The report then examines the U.S. market for broadwoven fabrics in terms of consumer characteristics and factors affecting demand in major market segments, and trends in U.S. consumption and production of principal fabric types. An analysis of U.S. trade follows, including trends in U.S. imports and exports and U.S. and foreign trade measures affecting them. The report concludes with an overview of the foreign industry.

## Products and End Uses

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Broadwoven fabrics are used extensively in apparel, such as denim, corduroy, and gabardine in pants; broadcloth and oxford cloth in shirts; and organdy, brocade, and taffeta in formal dresses. The fabrics are also used in home textiles, such as muslin and percale in bed linens, terry cloth in towels, and damask in table linens, and in other consumer and industrial goods, such as tents, luggage, carpet backings, filters, automobile air bags and hoses, and geotextiles (e.g., soil wall reinforcements). Broadwoven fabrics can be made wholly or in blends of natural fibers, such as cotton, wool, and silk; artificial fibers, including acetate and rayon; and synthetic fibers, such as polyester, nylon, and acrylic. The patterns of interlacing include the three basic weaves (plain, twill, and satin), the more complex weaves (e.g., jacquard, dobby, and pile), and the many variants of the basic and complex weaves (e.g., crepe, basket, and herringbone twill).

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<sup>1</sup> Other fabrics used in significant quantities are knitted and nonwoven fabrics. See K.L. Gandhi and J.S. Pearson, “Weaving to the Year 2025,” *Textiles Magazine* (Manchester, United Kingdom: The Textile Institute International, 2000), issue No. 1-00, p. 6.

<sup>2</sup> Broadwoven fabrics are classified in the Harmonized Tariff Schedule of the United States in chapters 50 (silk), 51 (wool), 52 (cotton), 53 (other vegetable fibers), 54 (manmade filaments), 55 (manmade staple fibers), 58 (pile, chenille, terry toweling, and gauze fabrics), and 70 (glass fibers). Excluded from this report are narrow woven fabrics (fabrics of a width not exceeding 30 centimeters in their final form) and nonwoven, tufted, knitted, coated, and tire cord fabrics, which generally are made in separate mills and with different technologies.

# Production Process

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The production of broadwoven fabrics can be divided into three broad stages--yarn formation, fabric weaving, and finishing. Although weaving is the defining step in producing such fabrics, the process depends critically on the production steps before and after it. Figure 1 illustrates the process in which vertically integrated mills spin cotton or polyester fibers into yarn, weave yarn into fabric, and dye or otherwise finish these materials at various stages of production, as discussed below.

## *Yarn Spinning<sup>3</sup>*

The yarn spinning process begins with the opening of bales of staple fibers to loosen the fibers and, especially for cotton, to blend the fibers and remove trash and short fibers. The fibers undergo “carding” to further clean, align, and form them into thin webs that are then condensed into a continuous, untwisted rope-like form called “sliver.” Combing is an optional step to clean and orient the fibers more completely and remove all but the longest fibers, resulting in a stronger, more compact, and smoother yarn. The sliver undergoes “drawing” to blend, straighten, and align the fibers, and to impart more uniformity to the sliver. The sliver is then ready for open-end (rotor) spinning; if destined for ring spinning, the sliver will undergo “roving,” in which the sliver is drawn into a finer form and given a slight twist. After the spinning process, the yarn is then wound onto a bobbin; it may also be further processed (e.g., dyed). The most common methods of spinning are ring spinning and open-end (rotor) spinning. Ring spinning uses a revolving traveler to insert twist in a yarn, and rotor spinning uses a rotor to collect and twist individual fibers into a yarn. Ring spinning gives a tighter twist than the open-end spinning method, but open-end spinning is much faster and usually lower in cost as it eliminates or combines steps required with ring spinning (e.g., roving).<sup>4</sup> However, the open-end method is limited to use in producing certain types and sizes of yarn.

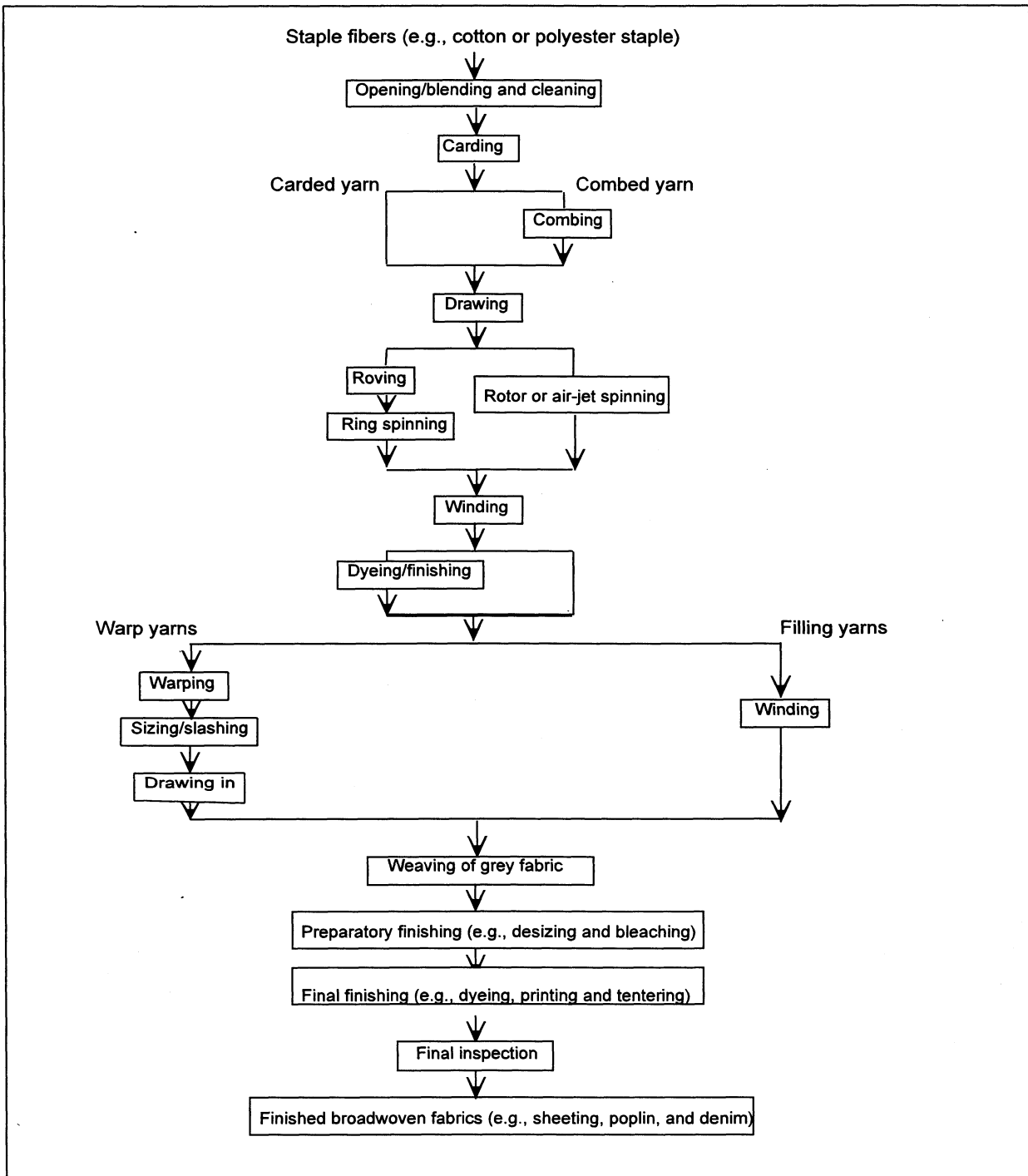
The century-old technology of ring spinning is still common in U.S. mills in its modern form, largely because it produces a strong, soft yarn with unique surface effects. Rotor and air-jet spinning, introduced about 30 and 15 years ago, respectively, accounted for more

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<sup>3</sup> Woven fabrics are made from spun yarn and manmade-filament yarn, the latter of which is made from filament fibers of indefinite length. Spun yarns are made from staple fibers, which usually measure 1 inch to 4 inches in length and which include natural fibers (e.g., cotton) and manmade staple fibers, the latter of which are prepared by cutting manmade-fiber filaments into staple length. Generally, large broadwoven fabric mills will produce their own spun yarns, but they will purchase filament yarns from independent producers.

<sup>4</sup> Compared with ring spinning rates, rotor spinning is about 8 times faster and air-jet spinning about 20 times faster. A trade source estimates U.S. cotton yarn production costs per kilogram in 1999 were about 18 percent less for rotor spinning than for ring spinning; reduced waste and lower labor and power usage are major reasons for the cost advantage. See International Textile Manufacturers Federation, *International Production Cost Comparison 1999, Spinning/Texturing/Weaving/Knitting* (Zurich, Switzerland), Jan. 2000.

**Figure 1**  
**Finished broadwoven fabric production process**



Source: Compiled by the U.S. International Trade Commission.

than one-half of U.S. spun yarn production in terms of poundage by 1996.<sup>5</sup> Some mills use a relatively new “linked ring spinning” process, which improves efficiency, cost effectiveness, and quality due in part to less handling of the yarn.<sup>6</sup> Another relatively new spinning innovation is vortex spinning, which can spin 100-percent cotton yarns with productivity levels similar to those of air-jet spinning.<sup>7</sup>

### ***Weaving and Yarn Preparation***

Weaving is a process in which warp yarns and filling yarns are interlaced at right angles using looms. Warp yarns run lengthwise on the loom and in the fabric; filling, or weft, yarns run across the width of the loom and fabric. The preparation of the warp yarns for weaving involves the accumulation of thousands of yarns wound side-by-side along a warp beam about the width of the loom in the “warping” process. The warp yarn undergoes “slashing,” in which a protective coating (“sizing”) is applied to the yarn to help prevent yarn breakage during weaving. Finally, in the “drawing in” process, the individual warp yarns are threaded through the loom assembly to the cloth beam, on which the fabric is wound as it is woven. Filling yarns are wound in packages from which yarn can be drawn off for efficient interlacing during weaving.

The means of inserting the filling yarns in the weaving process differ greatly by types of looms. In shuttle looms, which are still commonly used in many developing countries, the shuttle holds a bobbin that carries and releases a supply of yarn as the shuttle is slammed back and forth across the loom to insert the filling yarns in a process called “picking.” In shuttleless looms, the yarn is inserted by carrying or shooting discrete lengths of yarn across the loom by means of a projectile, rapier, or high-pressure air or water. Shuttleless looms have largely supplanted shuttle looms in the U.S. broadwoven fabric industry, accounting for 93 percent of the looms in place in 1999.<sup>8</sup> Compared with shuttle looms, shuttleless looms have much higher levels of productivity and generally produce wider fabrics with fewer defects and at reduced cost, owing to much faster operating speeds and lower power, space, and labor requirements per unit area of fabric.

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<sup>5</sup> Dan J. McCreight et al., *Short Staple Yarn Manufacturing*, Carolina Academic Press (Durham, NC: 1997).

<sup>6</sup> “Avondale Plans \$115 Million Upgrade,” *Southern Textile News*, June 5, 2000, p. 1, and Brenda Lloyd, *DNR*, “Alto Yarns New State-of-the-Art Facility,” June 7, 2000, p. 8, “Denim Mills Keep Modernizing,” Jan. 28, 2000, p. 13, and “Ring Spinning Is Hot, but Equipment Sales Are Not,” Mar. 1, 2000, p. 7.

<sup>7</sup> Walter N. Rozelle, “Vortex Spinning Gains Strength In U.S. Textiles,” *Textile World*, Sept. 1999, p. 73.

<sup>8</sup> U.S. Census Bureau, *Current Industrial Reports (CIR): Broadwoven Fabrics (Gray) Summary - 1999* (MQ313T(99)-5), June 2000.



## Finishing

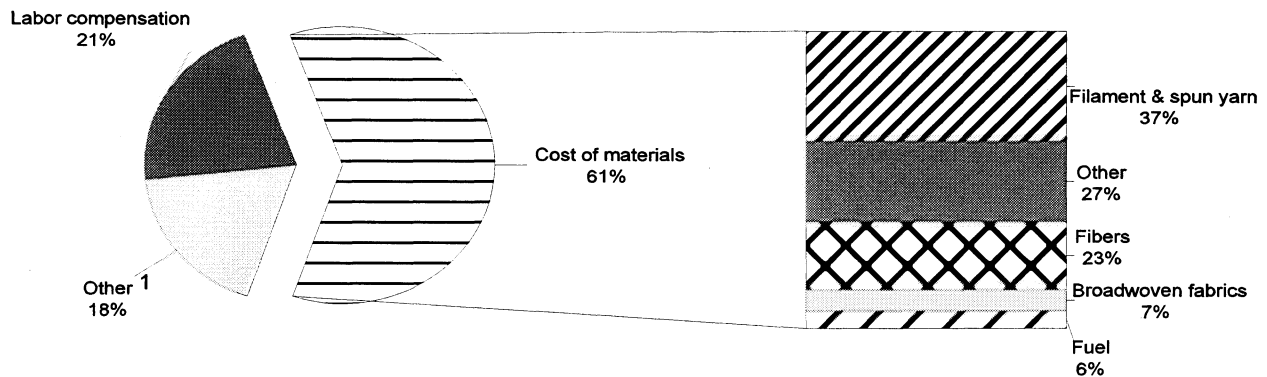
Fabrics come off the loom unfinished, referred to as “in the grey.” They may be finished by chemical, mechanical, and thermal treatments, which include the necessary removal of the sizing material applied to the warp yarns before weaving (desizing), as well as dyeing and printing. Additional finishing may occur to impart specific finished characteristics to the fabric, such as preshrinking, calendering, mercerizing, and napping.

## Factors of Production

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Key inputs in broadwoven fabric production include materials and labor. The relative importance of each has changed over the years, with materials increasing as a share of the total value of U.S. industry shipments from 56 percent in 1992 to 61 percent in 1998, and the labor declining from 25 to 21 percent (figure 2). The use of new technology has enabled the industry to improve productivity (e.g., the value added per production worker hour rose by 32 percent during the period), while employment levels fell.

**Figure 2**  
**Broadwoven fabric industry costs as a share of industry shipments, 1998**



<sup>1</sup> The “other” category also includes overhead costs and profit.

Source: Estimated by the Commission based on data of the U.S. Census Bureau, *Annual Survey of Manufactures: Statistics for Industry Groups and Industries (M98(AS)-1*, Aug. 20, 2000.

U.S. weaving mills purchase raw materials such as fibers and yarns from both domestic and foreign suppliers, although many of the sources are within North America due to their proximity and ability to fill orders quickly. Mills often contract with major suppliers to buy large quantities of fibers or yarns of certain types and quality levels. For example, U.S. weaving mills that are integrated back to yarn production use large quantities of cotton fiber, an agricultural product traded on world commodity markets and produced in many countries. The mills customarily make purchase commitments for cotton fiber several

months prior to anticipated use in production; they often hedge through forward contracts, purchases on the futures market, options contracts, or combinations of these activities. U.S. mills buy cotton primarily from U.S. growers under a Federal agricultural program devised to protect the growers and keep the domestic cotton price competitive to users. Under the program, mills that purchase U.S.-grown cotton receive payments when the domestic cotton price exceeds the world price.<sup>9</sup> During 1994-99, U.S. mills that spin fibers into yarns benefitted from generally depressed prices and ample supplies of cotton and polyester, the most widely used fibers in domestic broadwoven fabrics.

Other key factors of production are energy and water. Mills use large quantities of energy to run equipment, often around the clock, and in the many processes performed at elevated temperatures, often with steam. Water is the principal carrier fluid for chemicals used in applying size to yarns before weaving and in fabric finishing. To improve operating efficiencies, mills use production equipment that minimize energy and water usage, perform dyeing or other finishing operations by continuous rather than batch processing to help avoid unnecessary cooling and reheating and, use dye solutions and other chemical formulations with reduced water or steam requirements. Mills also employ equipment that reduce water to be evaporated in drying fabrics by first removing much of the liquid with squeeze rolls or extractors, and reclaim and recycle water and steam from production processes.

## U. S. INDUSTRY PROFILE

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### Industry Structure

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The North American Industry Classification System (NAICS), which replaced the U.S.-based Standard Industrial Classification (SIC) system beginning with 1997 data, classifies broadwoven fabric mills by their primary activity--weaving or finishing.<sup>10</sup> Mills primarily weaving fabrics are in Industry 313210 (Broadwoven Fabric Mills) and those primarily finishing fabrics are in Industry 313311 (Broadwoven Fabric Finishing Mills). The weaving mill group also includes mills that spin their own yarn and/or finish their own fabric and some mills that additionally produce end-use goods such as towels, sheets, and pillowcases. The finishing mill group also includes "converters" that buy domestic or imported grey fabrics, have them finished on contract, and sell the fabrics at wholesale.

The U.S. broadwoven fabric industry (NAICS 313210 and 313311) consists of relatively few large firms, most of which count weaving as their primary activity, and many small ones. In general, the small firms either weave or finish fabrics, although some may spin their own yarn or finish their own fabric. Most firms primarily engaged in finishing are

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<sup>9</sup> For additional information on cotton, see USITC, *Industry & Trade Summary--Cotton*, USITC publication 3391, Feb. 2001.

<sup>10</sup> The United States, Canada, and Mexico jointly developed the NAICS to provide a consistent framework for collecting, analyzing, and disseminating industrial statistics of the three NAFTA countries.

small, particularly the converters, and accounted for about 45 percent of the total number of finishing mills in 1997. Weaving mills tend to operate on a larger scale than finishing mills, partly reflecting the larger production volume in weaving and the greater number of operations in vertically integrated weaving mills than in most finishing mills. Based on U.S. Census Bureau data in the County Business Patterns for 1998, weaving mills on average employ 141 workers per establishment, compared with 36 in each finishing mill.

The large U.S. weaving firms generally produce a wide range of products, use multiple plants, and are vertically integrated from yarn spinning through fabric weaving and finishing, and, in some cases, even production of end-use goods.<sup>11</sup> This description generally fits the firms whose recent business strategies are summarized in tabular form in appendix A. The large firms typically finish their own fabrics, though they may contract finishing operations to independent mills, for example, during particularly busy manufacturing periods or for specialized applications. Some large firms also finish fabrics on contract for other companies as a regular activity or during lulls in their own operations. Firms integrated forward into fabrication of end-use products traditionally have made towels, bed sheets, or other home textiles whose manufacture requires only a few, highly automated steps after fabric finishing. Since the implementation of NAFTA in 1994, some U.S. fabric firms have integrated forward into the production of apparel and industrial products in Mexico.

The domestic industry is characterized by product specialization. Weaving and finishing mills each tend to specialize in either cotton, wool, or manmade-fiber fabrics, in part because of differences in the properties of the fibers and yarns themselves and, in turn, in needed equipment and manufacturing processes. Thus, no firm dominates the overall U.S. broadwoven fabric market, although a few firms have leading positions in selected market segments, such as Burlington Industries in worsted wool fabrics for apparel, Dan River in fabrics for men's dress shirts, Galey & Lord in corduroy fabrics, Avondale in fabrics for uniforms and other work apparel, and Cone Mills and Galey & Lord in denim fabrics.<sup>12</sup>

U.S. broadwoven fabric firms market their output through several channels of distribution. In general, weaving mills sell grey fabrics to independent finishing mills and converters. Both weaving mills and converters sell finished fabrics to producers of end-use products, such as apparel, home textiles, and industrial goods, mainly through their own sales forces or independent commissioned sales agents. Weaving mills also sell finished fabrics to distributors and converters. A major market for some U.S. fabric mills is the U.S. Armed

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<sup>11</sup> For example, Milliken & Company, believed to be the largest U.S. textile firm, produces apparel fabrics, table linens, laundry products such as mops and shop towels, carpet, and chemicals in more than 60 plants worldwide. Information is from Milliken's homepage at <http://www.milliken.com>, retrieved Feb. 7, 2000.

<sup>12</sup> Company information from 10-K Forms filed with the U.S. Securities and Exchange Commission (SEC) by Burlington Industries, Inc., Dec. 18, 1998; Dan River Inc., Mar. 15, 2000; Galey & Lord, Inc., Dec. 30, 1999; Cone Mills Corp., Mar. 29, 2000; Culp, Inc., July 30, 1999; and Avondale Inc., Nov. 12, 1998. The 10-K Forms are available from the SEC Web site at <[www.sec.gov/Archives/edgar/data](http://www.sec.gov/Archives/edgar/data)>.

Forces, which is estimated to have purchased about \$450 million worth of uniforms, parachutes, and other textile articles made of broadwoven fabrics in 1999.<sup>13</sup>

## Recent Trends

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The domestic industry posted little or no growth in shipments during 1994-99, a period of strong U.S. economic growth. As shown in table 1, industry shipments rose from an annual average of \$24.5 billion during 1994-96 to a high of \$25.0 billion in 1997, and then declined thereafter, to \$23.0 billion in 1999. Preliminary data show that the decline continued into 2000. Industry employment fell by 19 percent during 1994-99 to 182,000 workers; it had totaled as much as 247,000 workers in 1989 and 354,000 in 1979. 19 percent during 1994-99 to 182,000 workers; it had totaled as much as 247,000 workers in 1989 and 354,000 in 1979.

The relative decline of the domestic industry against a backdrop of strong economic growth during 1994-99 reflected an increasingly competitive domestic market, exacerbated in recent years by heavy pricing pressures from Asian exporters of fabrics and end-use goods, especially apparel. According to U.S. industry sources, Asian countries expanded their exports to the U.S. market in the aftermath of the Asian financial crisis of 1997 and 1998 in an effort to earn much-needed foreign exchange, aided in large part by the accompanying significant currency devaluations that effectively reduced dollar prices of their goods in the U.S. market.<sup>14</sup>

U.S. imports of broadwoven fabrics rose 6 percent by value during 1994-99, and they expanded their share of the U.S. broadwoven fabric market from 16 percent in 1994 to about 17 percent in 1999 (see "U.S. consumption" for more information on market conditions). The direct competition from fabric imports was outweighed, however, by indirect competition from the larger, more rapidly rising importation of end-use products, especially apparel. The U.S. broadwoven fabric industry's major customer, the apparel industry, has lost an even greater market share to imports. U.S. apparel imports now account for an estimated 60 percent of the domestic apparel market, up from 45 percent in 1994<sup>15</sup>. The U.S. broadwoven fabric industry faces a shrinking U.S. apparel manufacturing base as apparel imports continue to increase, thereby limiting domestic demand for U.S. fabrics. Imported apparel often uses foreign fabrics, thereby indirectly competing with U.S.-produced fabrics. Weak domestic demand for U.S. apparel fabrics was offset, to some extent, by the growth in U.S. exports of apparel fabrics to the Caribbean countries and Mexico.

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<sup>13</sup> Estimate by the Commission based on data from the Defense Logistics Agency, Philadelphia, PA, and Hardy B. Poole, American Textile Manufacturers Institute, Washington, DC, interview by USITC staff, July 14, 2000. The "Berry Amendment," enacted as Title IX of Public Law 102-396, as amended, requires U.S. military procurement of uniforms and other textile articles, with some exceptions, to be domestic goods. In addition, U.S. Government purchases of textiles or other products generally are to favor U.S. goods, as provided under the Buy American Act of 1933, as amended by Title VIII of Public Law 100-418 in 1988 and Title IV of Public Law 103-335 in 1994.

<sup>14</sup> American Textile Manufacturers Institute (ATMI), Washington, DC, *Textile HiLights*, Dec. 1998, p. iv.

<sup>15</sup> Estimated by the Commission based on official statistics of the U.S. Department of Commerce.

**Table 1**  
**Broadwoven fabrics: U.S. industry profile, 1994-99<sup>1</sup>**

Item	1994	1995	1996	1997	1998	1999
<b>Establishments:</b>						
Weaving mills (number) .....	899	917	969	930	924	( <sup>2</sup> )
Finishing mills (number) .....	519	564	681	738	780	( <sup>2</sup> )
Total (number) .....	1,418	1,481	1,650	1,668	1,704	( <sup>2</sup> )
<b>Employees:</b>						
Weaving mills (1,000) .....	167.0	163.9	155.4	151.0	146.6	134.5
Finishing mills (1,000) .....	58.3	58.1	54.6	52.8	50.5	47.4
Total (1,000) .....	225.3	222.0	210.0	203.8	197.1	181.9
<b>Industry shipments:</b>						
Weaving mills (million dollars) .....	17,638.0	18,389.3	18,204.4	18,241.1	18,155.2	17,011.4
Finishing mills (million dollars) .....	6,615.8	6,336.8	6,309.0	6,756.6	6,426.9	6,026.7
Total (million dollars) .....	24,253.8	24,726.1	24,513.4	24,997.7	24,582.1	23,038.1
<b>Value added by manufacture:</b>						
Weaving mills (million dollars) .....	7,577.0	7,564.0	7,449.9	7,492.2	7,759.7	( <sup>2</sup> )
Finishing mills (million dollars) .....	2,657.0	2,738.5	2,748.4	4,076.7	3,899.3	( <sup>2</sup> )
Total (million dollars) .....	10,234.0	10,302.5	10,198.3	11,568.9	11,659.0	( <sup>2</sup> )
<b>New capital expenditures:</b>						
Weaving mills (million dollars) .....	845.2	1,039.3	765.6	894.5	855.1	( <sup>2</sup> )
Finishing mills (million dollars) .....	205.9	247.3	187.4	311.1	292.3	( <sup>2</sup> )
Total (million dollars) .....	1,051.1	1,286.6	953.0	1,205.6	1,147.4	( <sup>2</sup> )
<b>Production workers' average hourly earnings:</b>						
Weaving mills (dollars) .....	9.73	10.03	10.25	10.64	10.99	11.25
Finishing mills (dollars) .....	9.49	9.64	10.06	10.47	10.82	10.94
All manufacturing (dollars) .....	12.07	12.37	12.77	13.17	13.49	13.91

<sup>1</sup> U.S. Census Bureau industry data used in this table beginning with 1997 are in terms of the NAICS and, thus, are not always comparable to pre-1997 data, which are based on the old SIC code. Chief among the differences between the two codes is the classification of converters (establishments that buy grey fabrics, have them finished on contract, and sell the fabrics at wholesale), which are classified in the NAICS as a fabric finishing mill (Industry 313311), but which were classified in the SIC as part of the Wholesale Trade: Piece Goods, Notions, and Dry Goods industry (SIC code 5131).

<sup>2</sup> Not available.

Source: Data compiled from official statistics as follows: Establishments data from U.S. Census Bureau, County Business Patterns, 1998 and selected back issues; employment and earnings data from U.S. Bureau of Labor Statistics, National Employment, Hours, and Earnings; and value of shipments, value added, and capital expenditures data from U.S. Census Bureau, Annual Survey of Manufactures, M98(AS)-1 and selected back issues, and 1997 Economic Census - Manufacturing Industry Series: Broadwoven Fabric Mills and Broadwoven Fabric Finishing Mills. Data for the number of establishments for finishing mills in 1998 and U.S. shipments data for 1999 were estimated by the Commission, based on the sources listed above.

Foreign competition in the U.S. market for fabrics, coupled with growing imports of apparel, has limited the ability of U.S. mills to pass higher costs on to customers. The ongoing phaseout of textile and apparel quotas likely will further strengthen the competitive position of the many textile-exporting countries that have the ability and willingness to establish a significant presence in the U.S. market for broadwoven fabrics and for apparel, further shrinking the market for U.S.-made apparel fabrics (see "U.S. trade measures" for further information on the quota phaseout).

Nevertheless, U.S. mills are among the most productive in the world in weaving high-volume commodity fabrics, because much of their investments over time have been in high-speed, automated technology. To respond more quickly to customer requirements and changing market conditions, mills have invested in new production, information, and service technologies in an effort to improve productivity, customer service, and their ability to produce unique products in a diverse range and in smaller lot sizes than in the past. During 1994-98, industry capital expenditures on new plants and equipment averaged about \$1.1 billion a year (see table 1); they averaged 4.9 percent of annual shipments for the weavers and 3.8 percent for the finishers.

As the U.S. industry increased its use of new technologies, required skill levels rose for many jobs in the mills, such as in maintenance of the increasingly complex machinery.<sup>16</sup> Industry observers noted that, in the tight U.S. labor market of recent years, textile mills experienced difficulty finding qualified workers.<sup>17</sup> This difficulty could be a result of lower wage rates in the textile industry than for many other manufacturing industries, largely because of intense competition in textile markets. According to data of the U.S. Bureau of Labor Statistics, in 1999, average hourly earnings were \$11.25 in weaving and \$10.94 in finishing, compared with \$13.91 for all manufacturing.

Despite the continued modernization of the domestic industry, its profit performance fluctuated during 1994-99. As shown in table 2, industry profitability generally trended down, particularly for the weaving mills, whose capacity utilization and return on assets declined, in some cases by more than those for textile mill products overall. Although post-1998 capacity utilization data for the industry are not available, industry analysts indicate that the difficult conditions have continued. The analysts attributed the industry difficulties to such factors as excess capacity for some fabrics, especially denim and basic commodity fabrics, and pricing pressures, leading to reduced profit margins. The analysts also noted that the Asian financial crisis and import growth accentuated these problems. During 1994-99, firms closed plants, shed unprofitable product lines, consolidated operations, reduced U.S. capacity, or shifted production to lower wage countries. Some relatively large firms filed for bankruptcy, and some publicly owned firms experienced significant drops in their stock prices or downgrading of their credit ratings, potentially hindering their ability to obtain new capital.<sup>18</sup>

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<sup>16</sup> Richard W. Mason, "Training Backs Burlington's Maintenance," *Textile World*, Feb. 1999, p. 53.

<sup>17</sup> S. Gray Maycumber, "New ATMI Chief Sees Brighter 2000 for Textiles," *DNR*, Feb. 23, 2000, p. 12, and John W. McCurry, "Textile Firms Face Tight Labor Pool," *Textile World*, June 1998, p. 22.

<sup>18</sup> Information in paragraph is from Christopher H. Delporte, "Textiles On The Edge of 2000," *America's Textiles International*, May 1999, p. 104; Stella M. Hopkins, "Textile Industry

(continued...)

**Table 2**  
**Broadwoven fabrics and textile mill products: Industry performance, 1994-99**

Item	Percent					
	1994	1995	1996	1997	1998	1999
Return on sales: <sup>1</sup>						
Weaving mills .....	3.6	3.5	1.8	1.9	2.8	2.4
Finishing mills .....	3.8	3.1	3.0	3.4	4.0	4.3
Textile mill products .....	3.7	3.5	2.6	2.9	3.4	2.5
Return on assets: <sup>1</sup>						
Weaving mills .....	12.5	9.5	4.6	6.7	6.6	5.5
Finishing mills .....	11.8	9.3	9.5	11.0	7.7	14.7
Textile mill products .....	9.7	10.7	7.1	8.3	8.8	5.7
Sales-to-inventory ratio: <sup>1</sup>						
Weaving mills .....	15.7	9.8	9.9	14.3	9.2	10.1
Finishing mills .....	14.8	13.7	15.2	15.5	9.7	18.8
Textile mill products .....	10.6	12.0	11.0	11.5	10.3	9.1
Full-production capacity utilization rate: <sup>2</sup>						
Weaving mills .....	92	88	86	89	81	( <sup>3</sup> )
Finishing mills .....	89	82	83	82	66	( <sup>3</sup> )
Textile mill products .....	87	82	81	81	74	( <sup>3</sup> )

<sup>1</sup> Calculated by the Commission based on the ratios for the weaving and finishing mills using summations, across relevant SIC categories, of the Dun & Bradstreet figures for inventory, total assets, net sales, and net profit after tax; ratios for textile mill products are as listed by Dun & Bradstreet.

<sup>2</sup> Calculated by the Commission based on the rates for weaving and finishing for 1994-97 by weighting the official reported rates of relevant SIC categories according to their respective shares of the total value added in weaving or in finishing; rates for 1998 were estimated by using the value-added percentages for 1997. Rates for textile mill products are as reported by the U.S. Census Bureau.

<sup>3</sup> Not available.

Source: Capacity utilization rates were compiled from official statistics of the U.S. Census Bureau, CIR: Survey of Plant Capacity - 1998 [MQ-C1(98)]. All other data were compiled from statistics of Dun & Bradstreet Information Services, Industry Norms & Key Business Ratios, Desk-Top Edition 1998-99 and selected back issues, Dun & Bradstreet (New York, NY).

<sup>18</sup> (...continued)

Hampered by Weak Apparel Sector," Nov. 14, 1999, found at Internet address [NewscastEmailAlert@emailalert.newscast.com](mailto:NewscastEmailAlert@emailalert.newscast.com), retrieved Nov. 16, 1999; Peter Krouse, "Burlington Debt Drops into Junk Bond Category, Textile Industry Troubles Have Turned Investment Grade Bonds Into Riskier Investments," Jan. 15, 2000, found at [NewscastEmailAlert@emailalert.newscast.com](mailto:NewscastEmailAlert@emailalert.newscast.com), retrieved Jan. 18, 2000; Brenda Lloyd, "Textile, Apparel Stocks Hurt by Industry Woes," *DNR*, Dec. 13, 1999, p. 6; Kay Norwood, "Outlook 2000: Better," *Southern Textile News*, Jan. 31, 2000, p. 1; and Craig Sirois, "Textile Industry," *The Value Line Investment Survey*, Nov. 19, 1999, p. 1628.

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## **Business Strategies**

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The difficult conditions faced by the domestic industry in recent years and the prospect of increased import competition in the future have spurred firms to implement strategies designed to enhance their competitiveness and profitability. A key factor behind these business strategies has been the industry's shrinking domestic customer base, particularly in apparel manufacturing. Mills have reduced or eliminated production of apparel fabrics, especially low-profit-margin commodity fabrics made in large quantities here and abroad. Mills have also expanded production of fabrics that are less sensitive to import competition, such as those for home textile and industrial products. To the extent that firms are maintaining domestic production of apparel fabrics, they are seeking to increase the value-added of the fabrics, while moving production of less value-added fabrics offshore. In particular, U.S. fabric firms have invested in production in Mexico since the implementation of NAFTA in 1994 in an effort to benefit from NAFTA trade preferences, along with lower operating costs and closer proximity to their customers. Some domestic mills that are moving their domestic production into higher value-added products have curtailed the sale of grey fabrics and are focusing on marketing finished fabrics. The following discussion on business strategies draws on information summarized in tabular form in appendix A and obtained from company annual reports and submissions to the U.S. Securities and Exchange Commission (e.g., Form 10-K reports).

### ***Restructuring***

A number of broadwoven fabric firms have restructured their operations to become more vertically integrated, while others have sought to increase market share in a particular product segment or to diversify into more products and markets. Vertical integration enables mills to secure more control over their yarn supply and quality, improve capacity utilization, reduce costs, and enhance efficiency, product quality, design innovation, and customer delivery. It also enables mills to incorporate yarn design into their fabric design process. Downstream integration has allowed firms to benefit from greater profitability of higher value-added goods, whether finished fabrics or end-use products such as apparel. For example, Galey & Lord entered into apparel production through the acquisition of a Mexican apparel producer in 1996 in an effort to offer customers a complete package of fabrics and garments from one source.

Firms have also pursued mergers and acquisitions to increase production capacity and market share, diversify product lines, and enter new markets and channels of distribution. For example, Avondale's acquisition of the Graniteville Co. in 1996 enabled it to enter the market for utility wear fabrics used in work clothing. Industry analysts noted that increased company size as a result of mergers or acquisitions may enable firms to provide the volume and variety sought by their fabric customers, and to reduce unit costs by eliminating duplicate operations, improving productivity, and achieving economies of scale.

U.S. fabric firms have divested less profitable or noncore operations to increase their focus on specific product offerings. For example, Springs Industries sold several fabric business segments during 1996-99 to focus more on home furnishing products, and Thomaston Mills



ceased production of denim fabric and industrial yarns in 1999 to focus on operations with the most profitability and growth potential. Firms have also streamlined management and operations to reduce costs, and improve efficiency and customer service. In 1999, Cone Mills announced a comprehensive downsizing and reorganization plan to achieve savings in its apparel fabric and commission finishing segments. Along with closing some facilities, Cone Mills downsized its administrative and manufacturing staffs to better match its sales base and respond to customer cycle times; merged its denim and sportswear fabric operations to better serve the growing casual wear market; and downsized its screen-printing operations to reduce costs and improve efficiency.<sup>19</sup>

### ***Product-focused Strategies***

Although the domestic industry has a history of developing and refining manufacturing processes and products, such as introducing more effective dyeing methods and new fabric styles, it has had limited involvement in basic research that engenders breakthroughs or fundamentally new products and processes. For most innovations, mills have relied on research and development (R&D) of producers of manmade fibers, dyes and chemical finishes, machinery, computers, and software. However, several fabric firms have significant R&D programs. Milliken & Company, believed to be the largest U.S. textile producer, reportedly has the world's largest textile research center and has generated more than 1,300 patents.<sup>20</sup> Burlington Industries, with an R&D program averaging about \$13 million annually, recently acquired majority ownership of a research firm (Nano-Tex) that uses molecular engineering to develop fabrics with new textile properties, such as fabrics that do not wrinkle or absorb water.<sup>21</sup>

A number of firms focus on making specialty fabrics for high-performance industrial applications, such as puncture-proof materials. Such firms engineer products, often new, unique and proprietary, to customer specifications.<sup>22</sup> Recognizing that constituent fabrics can contribute significantly to an end product's consumer appeal, producers of apparel and home textile fabrics are offering innovative fabrics that reflect fashion trends, are diverse, and frequently change. For example, Quaker Fabric has expanded its line of upholstery fabrics to more than 3,000 styles, with about 700 introduced each year.<sup>23</sup> Valdese Weavers, a supplier of fabrics for upholstery and other applications, reportedly has 80,000 fabric patterns ready for use and annually adds about 7,500 patterns.<sup>24</sup> Denim producers market

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<sup>19</sup> Based on 10-K Form filed with the SEC by Cone Mills Corp. on Apr. 1, 1999. The 10-K Forms are available from the SEC Web site at <[www.sec.gov/Archives/edgar/data](http://www.sec.gov/Archives/edgar/data)>.

<sup>20</sup> Milliken & Company homepage (<http://www.milliken.com>), retrieved Feb. 7, 2000.

<sup>21</sup> Based on 10-K Form filed with the SEC by Burlington Industries on Dec. 18, 1998, and "Burlington PerformanceWear and Galey & Lord to Utilize New Nano-Tex Fabric Technology," press release, Dec. 5, 2000, found at <http://www.burlington.com/news/>, retrieved Dec. 14, 2000.

<sup>22</sup> William C. Smith et al., "Industrials: Opportunities to Consider," *Textile World*, Feb. 1998, p. 28.

<sup>23</sup> Based on 10-K Form filed with the SEC by Quaker Fabric Corp. on Apr. 2, 1999.

<sup>24</sup> K.G. Melling, "Valdese Weavers Designs for the 21st Century," *Textile World*, Feb. 2000, p. 45.

their fabrics at multiple price points and differentiate them by fiber content, fabric weight, color, stretch properties, and finishes for visual and tactile effects and functional features.<sup>25</sup> Some broadwoven fabric producers have also begun to manufacture end-use goods, such as apparel and home textiles. Although several large firms have produced home textiles for many years, a number of firms during the 1990s either augmented their capacity and product selection in home textiles or newly entered the field, often as an extension of their fabric production. Also, some fabric producers have entered into apparel production offshore, particularly in Mexico, in wholly owned operations or through joint ventures with apparel producers in the host country. As suppliers of apparel or other end-use products, fabric producers offer customers simplified sourcing, lower costs, and faster time to market through “one-stop-shopping” with the purchase of the fabric and final product from one supplier. In general, these producers use their fabrics to make apparel to customer specifications and bearing customer brand names.

### *Strategic Alliances*

Producers have expanded their efforts to forge strategic alliances with major suppliers and customers, facilitated by the development of information technology to support communication linkages between firms. Communications and information exchange are key elements of these collaborative working relationships. Computerized technology enables producers to communicate with suppliers and customers through electronic data interchange (EDI); linkages through company Internet homepages, where customers can check order status or shipping and invoice information; and use of bar codes to track materials from procurement through production and delivery, combined with electronic records about products and their status. Producers are also increasing their use of online procurement, marketing, and selling. To facilitate electronic business between producers and their suppliers, the textile industry-sponsored Fabric and Suppliers Linkage Council (FASLINC) has developed voluntary standards and guidelines for EDI, bar coding, and product identification.<sup>26</sup>

A number of producers have implemented computer-supported “just-in-time” (JIT) manufacturing and quick response (QR) programs to manage production, inventory, and distribution. JIT focuses on relationships with suppliers and QR with customers. Both programs help to improve service, shorten lead times between order and delivery, and lower inventory costs, including reducing floor space for inventory. Under a typical JIT program, inputs from suppliers arrive at the mill ready to enter production with little or no inspection, testing, or time in inventory. Mills often implement supplier certification programs, under which JIT suppliers agree to adhere to strict requirements as to quality, delivery, and price.

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<sup>25</sup> Raye Rudie, “The Many Faces of Denim,” *Bobbin*, Apr. 1999, p. 40.

<sup>26</sup> ATMI, “FASLINC FACTS,” found at Internet address <http://www.atmi.org/Programs/faslinefacts.htm>, retrieved June 21, 2000. The Voluntary Interindustry Commerce Standards Association (VICS) has established standards for simplifying product and information flows between retailers and their suppliers (see its homepage at Internet address <http://www.vics.org>).

QR programs use technology and collaboration among firms in the supply chain from textile producers through retailers to reduce inefficiencies and lead times between order and delivery of products for consumer markets. According to a 1997 study, QR had resulted in significant consumer savings due to lower prices and improved service in terms of product availability and selection. Other cited sources of the consumer savings were industry consolidation, productivity improvement, growth in imports, and mass merchant retailing. A major finding was that suppliers of end-use product manufacturers (e.g., fabric producers) had contributed to the QR-related consumer savings primarily through cost and lead time reductions and product line rationalization relative to the market; firms implementing QR benefitted mainly through increased sales and market share rather than reduced inventory levels.<sup>27</sup> The sales-to-inventory ratio of the broadwoven fabric industry fluctuated in recent years but was notably lower in 1998 than in 1994 (see table 2). The low 1998 level indicates an increase in inventories relative to sales in 1998, possibly reflecting industry difficulty in moving inventory in the midst of the Asian financial crisis.

Many firms have recently incorporated JIT and QR programs into a more comprehensive integrated supply chain management program, which involves coordination and information sharing among fabric producers and other firms in the supply chain.<sup>28</sup> Supply chain management is being facilitated by a large outgrowth of e-business providers that specialize in online business-to-business communications tools for the textile and apparel sector.

### ***Global Strategies***

Producers are responding to the progressive dismantling of trade barriers in major world markets under the WTO and NAFTA by seeking manufacturing, marketing, and sourcing opportunities in global markets. Some firms have made globalization a key business strategy. For example, exports accounted for 37 percent of Cone Mills' denim fabric sales in 1999; foreign sales represented 23 percent of Culp's net sales in 1999 and 18 percent of Quaker Fabric's gross sales in 1998.<sup>29</sup> Many globally oriented firms market their products at international trade shows and through sales representatives and distributors stationed abroad, in addition to those in the United States. Other strategies involve the operation of distribution centers near customers in other countries and the dedication of resources to ensure equal attention to product development, quality, and service for foreign and domestic customers.

U.S. fabric producers have also invested in operations in other countries, most recently in Mexico, to be closer to their apparel manufacturing customers. A few of these producers have also begun to make apparel in Mexico, including Burlington Industries, Dan River, and Galey & Lord. In addition, in 1999, apparel manufacturer Tarrant Apparel Group announced

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<sup>27</sup> Kurt Salmon Associates, "Quick Response: A \$13 Billion Success Story," *Bobbin*, June 1997, p. 46.

<sup>28</sup> Peter J. Metz, "Demystifying Supply Chain Management," Winter 1998, found at Internet address <http://www.manufacturing.net/magaz...gistic/archives/1998/scmr/myst.htm>, retrieved June 15, 2000.

<sup>29</sup> Based on 10-K Forms filed with the SEC by Culp, Inc. on July 30, 1999; Quaker Fabric Corp., Apr. 2, 1999; and Cone Mills Corp., Mar. 29, 2000.

its entry into fabric production through an agreement to acquire a denim mill in Mexico.<sup>30</sup> The types of fabrics that U.S. firms are producing offshore are believed to be largely commodity fabrics that would sell at lower price points than those they manufacture domestically, or fabrics that they no longer produce domestically. Cone Mills, for example, produces basic denim for the mass market at its facility in Mexico, while its U.S. operations focus on producing fabrics for specialty retailers and department stores.<sup>31</sup> U.S. producers have also invested in other parts of the world to serve those regional markets. For example, Galey & Lord also has fabric operations in Canada, Italy, and Mexico. The firm's joint venture in Tunisia is a leading producer of fabrics for work and career apparel for the European market, and its European operation is a major producer of denim fabric for sale in Europe, North Africa, and Asia. Burlington Industries has a joint venture with a denim producer in India and produces fabrics for apparel and home textiles in Mexico. A U.S. investment firm recently acquired Consoltex Group, a Canadian producer of woven apparel, home textiles, and industrial fabrics with plants in Canada, Mexico, Costa Rica, and the United States.

A growing number of U.S. broadwoven fabric firms have ISO-9000 certification, which signifies that, according to standards of the International Organization for Standardization (ISO), management processes are in place and ongoing to ensure conformance of products with customer requirements.<sup>32</sup> Many firms believe the certification (which can apply to any manufacturing industry) can lead to improved quality management and competitiveness in global markets. In addition to ISO-9000, the ISO standards for textile products, production equipment, and labeling are gaining increased importance. Recently, the U.S. Federal Trade Commission amended its textile product labeling rules on names of fibers used in constituent fabrics, agreeing also to allow the use of alternative names of manmade fibers recognized by the ISO (e.g., viscose and elastane for rayon and spandex, respectively). The change is expected to help firms avoid the expense of different labels for the U.S. and foreign markets.<sup>33</sup>

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<sup>30</sup> Based on 10-K or 10-Q Forms filed with the SEC by Galey & Lord, Inc. on Dec. 30, 1999; Burlington Industries, Dec. 18, 1998; Cone Mills Corp., Apr. 1 and May 18, 1999; Dan River Inc., Mar. 29, 1999; and Tarrant Apparel Group, Mar. 1, 1999; the homepage of Consoltex Group Inc. (<http://www.consoltex.com>); and "News Release - AIP/CGI NB Acquisition Corp. (Canada) American Industrial Partners (U.S.)," Canadian News Wire, found at <http://www.newswire.ca/releases/October1999/18/c4727.html>, retrieved July 20, 2000.

<sup>31</sup> Based on 10-K Form filed with the SEC by Cone Mills on Mar. 29, 2000.

<sup>32</sup> The ISO, established in 1947, is a nongovernmental federation of national standards bodies from currently about 130 countries that work together to establish international standards, with a principal purpose the facilitation of international exchanges of goods and services. See ISO homepage (<http://www.iso.ch>).

<sup>33</sup> Information on labeling rule change is from Federal Trade Commission, *Threading Your Way Through the Labeling Requirements Under the Textile and Wool Acts*, Dec. 1998, found at Internet address <http://www.ftc.gov>, retrieved Mar. 31, 2000, and "New Generic Fiber Names Added by ISO," *DNR*, Sept. 13, 1999, p. 24.

# Technology and Productivity

U.S. broadwoven fabric mills have invested in new technology for each stage of production, from yarn manufacturing to fabric weaving and finishing, and increasingly for end-use product fabrication. These investments have enabled further gains in productivity, greater flexibility and responsiveness to diverse and changing customer needs, and shorter time from order to delivery. During the 1990s, U.S. mills invested in the latest generations of shuttleless looms and other new technologies, sometimes replacing equipment less than 10 years old (for example, see text box titled, "Modernization in the Denim Industry"). The investments have helped mills to reduce costs, expand capacity, enhance product quality, and meet standards for protecting workers, the public, and the environment. Mills have also invested in communications technologies to provide effective networking with both customers and suppliers, and logistics systems to control and monitor inventories and distribution.

## Modernization in the Denim Industry

The types of investments of the domestic industry during the 1990s can be seen from a review of the extensive modernization undertaken by major denim producers, as they prepared for present and future global competition during a period of overcapacity. New air-jet looms predominated in recent weaving-machine installations, often at the expense of projectile looms, because the air-jet looms are believed to provide the best mix of fabric quality, cost efficiency, and styling versatility by enabling the production of a wide range of fabric weights and styles and rapid loom changes from one style to another. The new looms were part of factory overhauls that also encompassed updating equipment for yarn production and preparation, and fabric finishing. Cone Mills had capital expenditures of about \$180 million during 1994-99, of which \$30 million was for top-to-bottom modernization of an integrated denim mill with computer-monitored process controls. Cone also augmented jacquard fabric-weaving capacity and installed computerized color-mixing systems and new fabric-preparation machinery in printing plants to ensure product quality and customer service. Avondale invested more than \$200 million during 1994-99, among other things, to outfit several areas with new-generation, technologically advanced machinery, build a new integrated denim weaving plant, and install new systems for reclaiming waste fibers and recovering chemicals used in processing.

Source: Brenda Lloyd, "Denim Mills Keep Modernizing," *DNR*, Jan. 28, 2000, p. 13, and 10-K Forms filed with the SEC by Cone Mills, Mar. 29, 2000, and Avondale, Nov. 12, 1999.

The adoption of new manufacturing technologies enabled U.S. broadwoven fabric firms to more than double their fabric output per loom-hour during 1989-99, from 16 square meters to 35 square meters. The increase was in addition to the significant gains achieved during 1977-88, when U.S. mills removed about one-half (or nearly 150,000) of their looms from production, while doubling their fabric output per loom hour.<sup>34</sup> Technological change has been a force behind the increased productivity and other developments, such as reduced labor input and heightened entry barriers in the industry due in part to the requisite expense and expertise to become and stay competitive.

Adoption of new technology in one process has often led to development of complementary technology in another. For example, efficient operation of shuttleless looms requires

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<sup>34</sup> U.S. Census Bureau, *CIR: Broadwoven Fabrics (Gray) Summary - 1999* (MQ313T(99)-5), issued June 2000, and selected back issues.

stronger, smoother, more even yarns than do shuttle looms, necessitating technology capable of producing such yarns. The larger fabric widths possible with shuttleless looms held limited advantage until finishing equipment was engineered to handle the wider fabrics. Also, the use of highly efficient technology in one area can lead to bottlenecks in another, where goods sit idle for extended periods while in the production sequence, if preceding or succeeding processes do not keep up with the more productive area.

### ***Yarn Preparation and Weaving***

Technological advances in yarn preparation for weaving include such improvements as automatic, in-process detection of yarn defects and repair of broken yarns, production of larger yarn packages, and automated removal of yarn packages from machinery. Pre-wet sizing, recently introduced in some mills reduces the amount of sizing agent needed to be applied in slashing and, in turn, the amount to be removed after weaving.<sup>35</sup> Sizing is estimated to account for 50 to 70 percent of the textile effluent load.<sup>36</sup>

The speed of weaving on shuttleless looms has accelerated since 1982, particularly for air- and water-jet looms (figure 3). Investments in new loom technology have enabled mills to increase their productivity, as well as flexibility in the types of fabric produced. Projectile and rapier looms are the most versatile in terms of the types of fabric woven, and projectile looms produce the widest fabrics. Partly because of their speed, the air-jet looms account for more than 50 percent of the single-filling-insertion shuttleless looms in place in the United States.<sup>37</sup>

### ***Dyeing and Finishing***

The ongoing technological changes in dyeing and finishing have focused on improving quality, speed, and flexibility of these processes, and developing equipment to handle different types of fabric. Other major concerns include conservation of energy, water, and other processing materials, and replacement of toxic chemicals with others that are of equivalent efficacy but less hazardous. Dyeing and finishing have become highly computerized to permit control of temperature, chemical concentrations, and other processing variables and in-process monitoring of fabric quality. Digital printing, a process of creating prints generated and designed by computer, is used currently for small-scale textile applications but appears to be nearing feasibility for large-scale fabric printing.

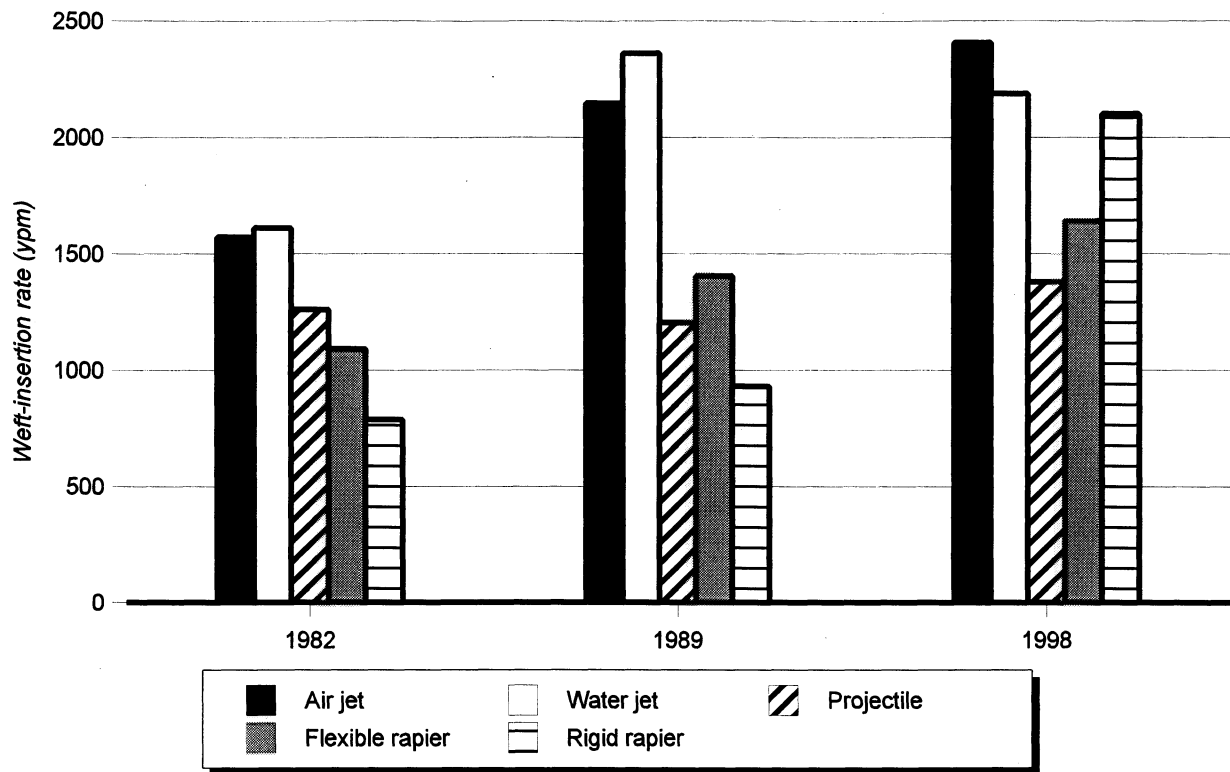
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<sup>35</sup> Warren S. Perkins, "New Slashing Technology Offers Big Benefits," *Textile Chemist and Colorist*, May 1999, p. 13.

<sup>36</sup> Andreas Sherrer, "Benninger: Savesize Pre-Wet Warp Sizing," *Textile World*, Apr. 2000, p. 42.

<sup>37</sup> About 55 percent of the shuttleless looms, including the air-jet, water-jet, projectile and rapier types, have single-insertion capability, meaning that only one filling yarn is interlaced with the warp yarns at any one time during weaving. Most others, except for certain pile-weaving looms, have multiple-filling insertion capability, meaning that 8, 10, or more filling yarns can be interlaced with the warp yarns in different weave patterns at any one time. U.S. Census Bureau, *CIR: Broadwoven Fabrics (Gray) Summary - 1999*, June 2000. Multiple-insertion looms weave much faster than single-insertion looms.

**Figure 3**  
**Shuttleless looms: Speed of weaving<sup>1</sup> with five types of looms, 1982, 1989, and 1998<sup>2</sup>**



<sup>1</sup> Weaving speed is measured by weft-insertion rate in yards of filling inserted per minute (y/m), essentially indicating the amount of fabric woven per minute.

<sup>2</sup> The figure shows the highest speeds of each loom type listed in the Textile World shuttleless weaving charts, Oct. 1982, Nov. 1989, and May 1998. The increases in those speeds from 1982 to 1998 were 53 percent for air jet, 36 percent for water jet, 9 percent for projectile, 50 percent for flexible rapier, and 167 percent for rigid rapier.

Source: McAllister Isaacs, Textile World, "Air Jets Blow Hot in the U.S. Weaving Market," Nov. 1989, p. 42, and Loom Makers Get Ready for ITMA 99," May 1998, p. 86.

Digital printing holds promise for a new era of textile printing with endless variety in customized printing and large print patterns unconstrained by printing-screen dimensions.<sup>38</sup>

Significant change is occurring in tentering, a finishing process at or near the end of the fabric production sequence that affects fabric quality. In tentering, fabric is pulled through a tenter frame while under width-wise tension in the presence of heat and moisture to ensure that the fabric has the desired width and number of yarns per inch in both directions and that

<sup>38</sup> Information in paragraph is from *Textile World* articles by Fred L. Cook, "AATCC Colors Its Way to Y2K," Sept. 1999, p. 91, McAllister Isaacs et al., "ITMA 99's Star: The Computer," Sept. 1999, p. 28, and Wayne A. Tincher, "The Jet Age Dawns at ITMA," Nov. 1999, p. 27; Phil Owen, "Digital Printing: Realities and Possibilities," *Textile Chemist and Colorist & American Dyestuff Reporter*, Feb. 2000, p. 22; and IT Strategies Inc., "Digital Printing: Prelude to the Revolution," *Bobbin*, Jan. 1997, p. 30.

the yarns are perpendicular to each other. Modern tenters run faster and can handle wider fabrics than in the past, and they contain in-process detectors to measure and correct for specific fabric parameters, such as the number of yarns per unit length. Some tenters are designed to handle different fabric widths and types, including knits.<sup>39</sup>

### ***CAD/CAM Systems***

The growing use of computer-aided design/computer-aided manufacturing (CAD/CAM) systems is revolutionizing textile design and the linkages among suppliers, producers, and customers in the textile supply chain. The flexibility, productivity, and information-storage ability of these systems enable mills to use digitized results of optical yarn-evenness testers for yarn quality control and as input for creating virtual fabrics on screen with different yarn characteristics, weave structures, colors, prints, and surface textures. CAD/CAM systems allow designers and customers to view and select from the virtual fabrics before the costly steps of making up fabric samples or commencing production for sale. Designs selected for production can be used to speed the development of the weave plan for the loom and of dye formulations or printing procedures. The CAD/CAM systems reduce cycle times for product development, and they improve accuracy, fabric quality, efficiency, flexibility, and responsiveness to customer needs over traditional ways of developing fabrics, in part because they facilitate coordination among operations. The CAD/CAM system of Valdese Weavers, for example, links the fabric pattern creation, loom settings, and production scheduling for weaving and finishing; the coordination reportedly results in loom downtimes of just minutes between the weaving of one fabric roll and the next.<sup>40</sup>

## **Health, Safety, and Environmental Regulations**

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Mills are subject to Federal, State, and local regulations that involve health and safety issues in protecting workers, the public health, and the environment. For example, regulations on workplace safety and worker health address exposure to cotton dust, noise, and formaldehyde and the handling of hazardous chemicals, and regulations on public health and the environment address the discharge and disposal of various substances. Industry compliance with extant and future regulations may affect its costs significantly, such as through installing new equipment, training workers in safety standards, monitoring effluents from finishing, or recycling hazardous substances.<sup>41</sup> Although U.S. textile industry officials

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<sup>39</sup> McAllister Isaacs and Edward J. Elliott, "Tenterframes: Finishing Plant Workhorses," *Textile World*, Sept. 1999, p. 110.

<sup>40</sup> Information in paragraph is from Stephen Gray, *CAD/CAM in Clothing and Textiles* (Hampshire, England: Gower Publishing Ltd., 1998), and K.G. Melling, *Textile World*, "CAD/CAM: Screen to Machine," Feb. 1998, p. 66, and "Valdese Weavers Designs for the 21st Century," Feb. 2000, p. 45. Valdese Weavers reportedly estimates the cost of a fabric pattern simulated on screen at about \$200, compared with \$1,500 to \$2,500 for a one-yard woven fabric sample.

<sup>41</sup> Information on U.S. health and safety regulations and industry practices is available on homepages of the U.S. Environmental Protection Agency (<http://www.epa.gov>) and Occupational  
(continued...)



claim that producers in developing countries do not incur similar costs, trade sources note that the technology acquired by U.S. industry to comply with environmental regulations has led to productivity gains, thereby partly offsetting the cost of compliance.

A program sponsored by the U.S. textile industry, called Encouraging Environmental Excellence (or E3), promotes environmental preservation through company implementation of action plans involving work in their plants and with suppliers, customers and communities, in addition to interaction with regulatory agencies. Company projects under the program, among other things, have resulted in sharing wastewater and sewage disposal costs with communities and more recycling of steam and solid waste such as paper and cotton waste. Reportedly, along with environmental improvements, participating firms have seen economic payoffs, such as those from conserving water and energy.<sup>42</sup>

The U.S. Environmental Protection Agency (EPA), acting under the Clean Air Act, has promulgated technology-based emission standards on hazardous pollutants in the air. Known as the maximum achievable control technology (MACT) program, the approach is to use available technology and work practices to reduce emissions. The program will affect many industries that emit potential air pollutants.<sup>43</sup> In the broadwoven fabric industry, the greatest impact is expected to be in dyeing and printing due to the nature of processing. The textile industry has worked with the EPA in several areas to develop the MACT standard for emissions, including gathering survey data on textile plant emissions to identify problem areas.<sup>44</sup>

## U.S. MARKET

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### Consumer Characteristics and Factors Affecting Demand

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The U.S. market for broadwoven fabrics, as measured by apparent consumption, totaled about \$21 billion in 1999. Although the market showed little growth overall during 1994-99, its composition changed significantly, as demand for apparel fabrics fell and that for home textiles and industrial fabrics rose. The domestic market for apparel fabrics, historically the principal market for domestic broadwoven fabrics, declined during the 1990s, as U.S. apparel production fell and apparel imports rose. More recently, an increase in imports of finished home textiles, such as bedsheets, has reduced demand for certain broadwoven fabrics. The share of the U.S. broadwoven fabric market accounted for by imports averaged

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<sup>41</sup> (...continued)

Safety and Health Administration (<http://www.osha.gov/index.html>), both of which have links to documents specific to the textile industry.

<sup>42</sup> ATMI, "E3 - Encouraging Environmental Excellence," found at Internet address <http://www.atmi.org/Programs/e3.html>, retrieved June 29, 2000, and James A. Morrissey, "Washington: More Attention to Environment," *Textile World*, Feb. 1998, p. 61.

<sup>43</sup> EPA, *Residual Risk Report to Congress* (EPA-453/R-99-001), Mar. 1999, found at Internet address [http://www.epa.gov/ttn/oarpg/t3/reports/risk\\_rep.pdf](http://www.epa.gov/ttn/oarpg/t3/reports/risk_rep.pdf), retrieved Feb. 4, 2000.

<sup>44</sup> James A. Morrissey, *Textile World*, "Environmental Issues Bear Watching," Feb. 2000, p. 14, and "Washington: More Attention to Environment," Feb. 1998, p. 61.

about 17 percent in 1999, compared with 16 percent in 1994. A U.S. industry source estimates that most imported broadwoven fabrics are for use in the production of apparel, while roughly one-half of domestic broadwoven fabrics are for use in the production of home textiles and one-third for apparel.<sup>45</sup>

## *Apparel*

U.S. demand for apparel fabrics is affected by such factors as trends in domestic woven apparel production, changes in fashion and consumer tastes, and fluctuations in consumer spending on apparel. Although the domestic market for apparel has expanded, imports have supplied all of the growth. As shown in figure 4, real growth in domestic consumer spending on apparel averaged 7 percent annually during 1994-99,<sup>46</sup> while that for U.S. imports of woven apparel averaged 6 percent annually. In contrast, real growth for both domestic broadwoven fabric and apparel shipments averaged only about 1 percent annually.<sup>47</sup> Kurt Salmon Associates estimates that imports accounted for 88 percent of the domestic apparel market in terms of quantity (square meter equivalents) in 1999, compared with 51 percent in 1992.<sup>48</sup> U.S. apparel imports are likely to continue to grow as U.S. import quotas are phased out (see section on “U.S. trade measures” for further information).<sup>49</sup>

The declining U.S. market for broadwoven apparel fabrics has been offset to some extent by increases in U.S. apparel fabric exports as a result of NAFTA. It is expected that U.S. broadwoven fabric producers will also benefit from the Trade and Development Act of 2000, which authorizes duty-free and quota-free access to the U.S. market for apparel assembled in countries in sub-Saharan Africa and the Caribbean Basin from U.S. fabrics (see “U.S. trade” for additional information). In addition, in an effort to recapture some of the apparel fabric market, some large U.S. apparel fabric manufacturers have begun to offer U.S. retailers and apparel manufacturers the full apparel “package” in which they use their own fabric in producing garments made to customer specifications.

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<sup>45</sup> Based on data from ATMI. The estimate for home textiles includes fabric made for captive use by vertically integrated mills. According to Kurt Salmon Associates (KSA), “Soft Goods Outlook<sup>SM</sup> 2000 – and Beyond,” Dec. 1999, one-third of total textile output goes to apparel.

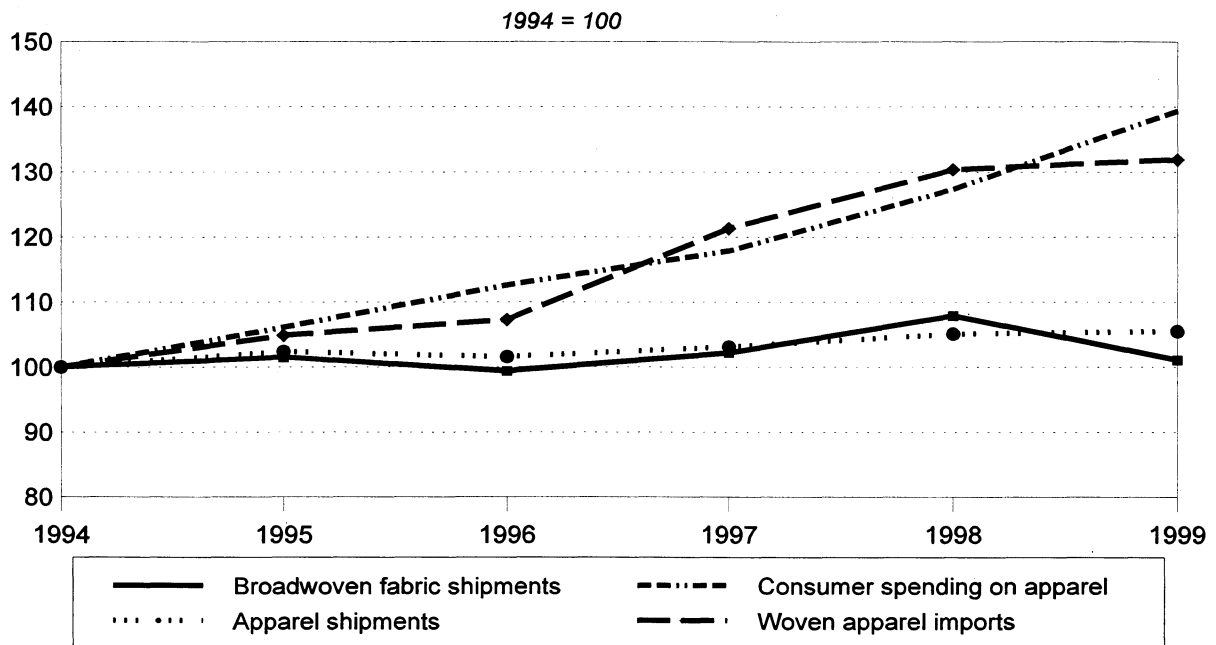
<sup>46</sup> Calculated based on personal consumption expenditures on apparel for males and females as reported by the U.S. Bureau of Economic Analysis (BEA) in table titled, “Underlying Detailed Estimates for PCE,” as reported in Stat-USA at <http://www.stat-usa.gov/online.nsf/NIPANav?OpenNavigator>, retrieved Dec. 30, 1999. Base year for data is 1996.

<sup>47</sup> Based on shipments data of the U.S. Census Bureau for SIC 23. Data for 1999 are estimated by the Commission.

<sup>48</sup> KSA, “Soft Goods Outlook<sup>SM</sup> 2000,” p. 9. Roughly 36 percent of the market is accounted for by imports from Mexico and the Caribbean countries, a large share of which are made from U.S. fabrics.

<sup>49</sup> For additional information about the apparel industry, see USITC, *Industry & Trade Summary—Apparel*, USITC publication 3169, Mar. 1999.

**Figure 4**  
**Indexes of U.S. shipments of broadwoven fabrics and apparel, consumer spending on apparel, and imports of woven apparel, 1994-99**



Source: Apparel shipments estimated by the Commission based on official statistics of the U.S. Census Bureau and the U.S. Bureau of Labor Statistics. All other data compiled from official statistics of the U.S. Department of Commerce.

Consumer taste is another important factor affecting the market for broadwoven apparel fabrics. Knit apparel has become increasingly popular among consumers looking for comfort. For example, in women’s career apparel, knit sweater sets have replaced part of the market previously held by tailored apparel, which is generally made with broadwoven fabric. Similarly, some market segments, such as that for wool broadwoven fabrics, have been particularly affected by the adoption of casual attire in the work place, reducing consumer demand for tailored apparel using such fabrics. In response to market demand for more comfortable garments, broadwoven fabric manufacturers have begun offering a larger selection of woven fabrics made at least in part with fibers and yarns that stretch.

### *Home Textiles*

Demand for broadwoven fabrics in home textiles has reportedly grown significantly since 1994. It is estimated that roughly 7 billion square meters of domestic broadwoven fabrics were used in the manufacture of home textiles in 1998.<sup>50</sup> The market for home textile fabrics is divided into three broad end-use segments, namely upholstered furniture; carpets and rugs (e.g., carpet backing); and bed, bath, and other home furnishings (bed and bath). Within

<sup>50</sup> Estimated by the Commission based on data from ATMI. Some of the fabric used in home textiles include fabric that is produced and consumed by vertically integrated mills.

each of these segments, the market can be further split into residential and institutional uses. For all three market segments, residential uses are believed to be the largest domestic market for home textile fabrics.<sup>51</sup>

The residential home textile fabric market has benefitted from favorable demographics, including the creation of nearly 6 million new households during 1994-99.<sup>52</sup> Baby boomers (those born between 1946 and 1964) are now spending more time at home and seeking to make their homes more comfortable, often referred to in the trade as the “cocooning effect.”<sup>53</sup> Baby boomers account for roughly 43 percent of U.S. households and have the highest average per capita income.<sup>54</sup> In addition, the average size of new homes has increased in recent years, which has contributed to the increase in purchases of home textiles (and thus home textile fabrics) per home.<sup>55</sup>

Institutional home textile fabrics are used in products for the hospitality industry (e.g., hotels and restaurants), as well as for hospitals, nursing homes, and other institutional facilities. It is believed that U.S. consumption of institutional home textile fabrics has grown concurrent with the U.S. economy. New construction of motels and hotels, large users of home textiles, nearly tripled during 1994-99.<sup>56</sup> The products for the institutional market are generally more homogeneous and experience more import competition than those sold in the residential market.<sup>57</sup> Many institutional products, such as bedsheets, are commodity products that sell at low price points.

Demand for broadwoven fabrics in the home textile market also is to some extent determined by trends occurring in the specific market segment for which the fabric is used. Home fashion trends, the use of alternative materials, and the relative competitiveness of imported finished products all affect the demand for fabric.

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<sup>51</sup> In 1998, 11 percent of U.S. shipments of sheets, pillowcases, towels, and washcloths were made for the institutional market, with most of the remaining share being sold through traditional channels for residential use. U.S. Census Bureau, *CIR: Bed and Bath Furnishings, Summary 1998*, MQ314X(98)-5.

<sup>52</sup> U.S. Census Bureau, “Historical Income Tables-Divisions-Households by Median and Mean Income: 1976-1999,” found at Internet address <http://www.census.gov/hhes/income/histinc/inchhdet.html>, retrieved Oct. 29, 2000.

<sup>53</sup> For more information on the home textiles market, see USITC, *Industry & Trade Summary—Home Textiles*, USITC publication 3170, Mar. 1999, p. 15.

<sup>54</sup> Based on data from U.S. Census Bureau, “Historical Income Tables - Households by Median and Mean Income: 1967-1998,” found at Internet address <http://www.census.gov/hhes/income/histinc/h10.html>, retrieved Oct. 30, 2000. Data reflect households between ages 35 and 54.

<sup>55</sup> Culp, Inc., 10-K Form filed with the SEC on July 30, 1999, and National Association of Realtors, “NRA Expects Lower Interest Rates and Low Inflation,” news release, June 15, 1999, found at Internet address <http://nar.realtor.com/search/home.htm>, retrieved Dec. 30, 1999.

<sup>56</sup> Based on data from U.S. Census Bureau on the value of construction put in place in the United States, found at Internet address <http://www.stat-usa.gov/Online.nsf/vwFileLookup/C30TAB1.CE>, retrieved Dec. 30, 1999.

<sup>57</sup> Charles Bremer, ATMI, interview by USITC staff, Washington, DC, Nov. 16, 1999.

## Bed and Bath

The consumer market for bed and bath articles, including bed linens, comforters, pillows, towels, and draperies, has been strong, with real personal consumption expenditures for semidurable house furnishings increasing at an annual average rate of 3 percent during 1994-99.<sup>58</sup> The robust economy, accompanied by new construction and increased interest in home furnishings, has contributed to growth in this sector. Home fashion trends can significantly influence demand for broadwoven fabrics in this sector. For example, recent trends favor streamlined window fashions, which require less fabric than the elaborate window treatments popular early in the 1990s. The introduction of new bed and bath products also affects fabric demand. The introduction of high-count cotton sheets and oversized bath towels increased demand, while the introduction of knit sheets reduced demand for broadwoven fabrics.

Competition in the U.S. home textile market intensified during 1994-99, resulting in downward pressure on prices at retail. Imports accounted for an increasingly larger share of the domestic bed and bath market, generally competing at the lower price points in the market. For example, the import share of U.S. consumption of terry towels accounted for by imports in 1999 was 58 percent by quantity and 32 percent by value, compared with 1994 levels of 36 percent and 15 percent, respectively.<sup>59</sup>

Roughly one-fourth of the bed and bath products produced domestically are made in vertically integrated textile mills, which produce yarn, fabric, and the end-use product. The production process for sheets and terry toweling, in particular, is highly automated, and vertically integrated textile companies supply most of these products. U.S. shipments of sheets, pillowcases, and terry towels, which together account for an estimated one-third of U.S. bed and bath textile shipments, increased by slightly more than 20 percent during 1994-99.<sup>60</sup> Many of these products are sold under brand names owned or licensed by the textile companies, which generally sell their products directly to retailers and, in some instances, even manage inventories for retail customers.

## Upholstered Furniture

The U.S. upholstered furniture market reportedly increased at an annual average rate of roughly 8 percent in nominal terms during 1991-99.<sup>61</sup> Among the factors affecting demand for broadwoven upholstery fabric are style trends in the furniture industry. Furniture with a large, overstuffed design requires more fabric than that with a slim silhouette. Alternative materials, particularly leather, also compete with broadwoven fabric, although use of leather in furniture is relatively small. Reportedly, upholstered furniture consumers are increasingly

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<sup>58</sup> BEA, Personal Consumption Expenditures, as reported in table titled, "Underlying Detailed Estimates for PCE," as reported in Stat-USA at <http://www.stat-usa.gov/online.nsf/NIPANav?OpenNavigator>, retrieved Oct. 25, 2000.

Semidurable house furnishings also include lampshades, brooms, and brushes. Base year is 1996.

<sup>59</sup> U.S. Census Bureau, *CIR: Bed and Bath Furnishings* (MQ314X), Summary for 1994 and 1999.

<sup>60</sup> *Ibid.*

<sup>61</sup> Culp, Inc., 10-K Form filed with the SEC on July 30, 1999.

emphasizing product quality and quick delivery.<sup>62</sup> The competitive market forces for upholstery fabric generally favor domestic over imported fabrics. Because upholstered furniture is bulky to ship and is often made-to-order, import competition is less than in the bed and bath segment or the apparel market overall. According to a major upholstery fabric producer, upholstery fabrics compete less on price than on product styling and differentiation, quality, and customer service.<sup>63</sup>

## **Carpets and Rugs**

Broadwoven fabrics are frequently used as part of the backings of carpets and rugs, particularly tufted carpets and rugs, which account for most U.S. production. The base broadwoven fabric is usually made with polypropylene yarn and is a relatively low-value product.

Demand for broadwoven fabrics for carpet and rug backing is highly dependent on carpet and rug production. The U.S. market for carpets and rugs has been strong, despite a trend towards greater use of alternative flooring materials in the residential market. U.S. shipments of carpets and rugs increased by 20 percent during 1994-99.<sup>64</sup> Like the other home textile sectors, demand for carpets and rugs is influenced by changes in economic activity, and home decorating fashions. Carpets, for example, have lost market share to wood, tile, and laminates in the residential market, but the popularity of area rugs to cover these hard surfaces has increased.<sup>65</sup> The use of other backing techniques and materials, such as the use of foam, can also influence demand for broadwoven fabric in the carpet and rug market.

## ***Industrial***

The industrial fabric market is much smaller and more fragmented than the apparel and home textile markets, but it is growing as new fibers and finishes are developed, creating expanded opportunities for the use of broadwoven fabrics. The industrial fabrics market is estimated to consume just over 15 percent of U.S. broadwoven fabric production<sup>66</sup> and comprises numerous niche markets, as shown in table 3. Based on data provided from the Industrial Fabrics Association International (IFAI), it appears that three of the largest markets for industrial broadwoven fabrics in North America are medical protective products, the automotive industry, and geotextiles.

Factors influencing demand for industrial fabrics are generally unique to the market segment in which they are used, in part because many industrial fabrics are custom designed and manufactured to customer requirements. Hence, industrial broadwoven fabrics generally compete less on price and more on product performance compared with apparel and home

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<sup>62</sup> Culp, Inc., 10-K Form filed with the SEC on July 28, 2000.

<sup>63</sup> CMI Industries, Inc., 10-K Form filed with the SEC on Apr. 1, 1999.

<sup>64</sup> U.S. Census Bureau, *CIR: Carpets and Rugs* (MA314Q(99)-1), Summary 1999.

<sup>65</sup> "Rugs: State of the Industry," *Floor Covering Weekly*, Jan. 3, 2000, p. 1.

<sup>66</sup> Estimated by the Commission based on data from ATMI.

**Table 3****Broadwoven fabrics: Selected industrial market segments, end-use applications, and estimated market size for North America**

<b>Industrial market segment</b>	<b>Selected end uses</b>	<b>Estimated size of North American market for all types of fabric and broadwoven fabric in 1998</b>
Auto .....	Upholstery, carpet backing, air bags	Total market: 334 million square meters (msm) Broadwoven fabric market for airbags and upholstery applications: 80 msm
Geotextiles .....	Civil engineering (roads), construction	Total market: 420 msm Broadwoven fabric market: 90 msm
Fabric architecture .....	Awnings, tents, canopies, temporary buildings, roofs	Total market: 40 msm (all of which is broadwoven fabric)
Electronics .....	Circuit boards	Not available
Agriculture .....	Shade cloth, seed beds, drainage, ground frost protection	Not available
Marine and truck .....	Boat and truck covers, sails	Total market: 38 msm (all of which is broadwoven fabric)
Medical .....	Bandages, surgical drapes, protective barriers, synthetic skin	Total medical protection market (not including bandages and other medical): 2.9 billion square meters Broadwoven fabric medical protection market: 900 msm
Miscellaneous industrial ...	Filtration, sorption systems, textile reinforced adhesives	Not available
Safety and protective .....	Fire, chemical and biohazard protection, ballistic protection, cut and slash protection, particulate protection	Total market for particulate, ballistic, and thermal protection: 160 msm. Broadwoven fabric market: not available

Source: Estimated by the Commission primarily from IFAI data.

textile fabrics. For commodity types of industrial fabrics that have less specific requirements for their end uses and can be produced relatively inexpensively in mass quantities, competition is significant in terms of both fabrics and end-use products, such as tarpaulins.<sup>67</sup> For some end-use industrial applications, broadwoven fabrics compete with other types of fabrics, such as nonwoven or knit fabrics, and with other materials, such as paper or plastics. The choice to use broadwoven fabrics when there is an alternative choice is made based on a number of factors, including performance and, to some extent, price.

### **Medical Protection**

Demand for industrial fabrics used in medical protection products, such as medical protection apparel, surgical drapes and gowns, and bed pads, has increased during the past decade, in part because of efforts to protect workers in the healthcare industry from blood-borne diseases. Broadwoven fabrics account for an estimated 30 percent or less of the

<sup>67</sup> Joe Dieltz, Manager, Market Information, IFAI, telephone interview by USITC staff, Dec. 29, 1999.

fabrics used for medical protection products; nonwoven fabrics are believed to account for most of the market.<sup>68</sup> In general, medical protection products made of broadwoven fabrics are intended for multiple uses and therefore have a higher initial cost than those made of nonwoven fabrics, which are often disposable (i.e., one-time use). A major determinant of demand for broadwoven fabrics in this market segment is total costs, including those associated with the purchase, laundering (for woven products), and disposal (particularly for nonwoven products).

### **Automotive**

Demand for broadwoven fabrics used in automotive components, such as airbags, upholstery, convertible tops, tubes, and hoses, closely tracks North American production of motor vehicles. North American production of cars and trucks increased by 2 percent during 1994-98,<sup>69</sup> and then grew by nearly 10 percent in 1999.<sup>70</sup> Broadwoven fabrics compete in the automotive market with other fabrics, including knit and nonwoven fabrics, and with other materials, such as leather. One U.S. automotive fabric manufacturer, Collins & Aikman Corp., partly attributed its recent decline in automotive upholstery fabric sales to stronger demand for leather automobile upholstery.<sup>71</sup>

### **Geotextile**

Geotextiles are fabrics used in a wide range of civil engineering applications such as road construction, both as part of the road structure and for embankments, tunnels, and soil walls and slopes. Broadwoven fabrics compete with nonwoven fabrics and, to some extent, knit fabrics for use in geotextile applications. Performance and cost are the major factors affecting choice of product used. Broadwoven fabrics are used in situations in which stability of the fabric and strength are important product characteristics. The amount of new road construction in particular, as well as construction in general, has a significant effect on the market for geotextile products. The Transportation Equity Act of the 21<sup>st</sup> Century (TEA-21; Public Law 105-178) is expected to boost demand for geotextiles as a result of new funding for highway construction and repair.<sup>72</sup>

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<sup>68</sup> IFAI, *The North American Market for Protective Clothing - Spring 1997*, 1997, p. 51.

<sup>69</sup> Based on data from Automotive News, '99 *Market Handbook*, p. 17, and '98 *Market Handbook*, p. 26.

<sup>70</sup> Wards Automotive Reports, "Wards Reports Record North American Production in 1999," as reported by PR Newswire, Dec. 29, 1999.

<sup>71</sup> Collins & Aikman Corp., 10-K Form filed with the SEC on Mar. 26, 1999.

<sup>72</sup> Joe Dieltz, Manager, Market Information, IFAI, telephone interview by USITC staff, Dec. 29, 1999. The TEA-21 authorized a roughly 35-percent increase in annual funding in 1999 from 1997 levels for the national highway system and the interstate maintenance program. U.S. Department of Transportation, TEA-21 Fact Sheet, found at Internet address <http://www.fhwa.dot.gov/tea21/factsheets/index.htm>, retrieved Jan. 12, 2000.



# Consumption

Apparent U.S. consumption of broadwoven fabrics (U.S. producers' shipments minus exports plus the customs value of imports) decreased slightly during 1994-99 to an estimated \$21.2 billion (table 4). The share of apparent consumption accounted for by imports increased from 15.9 percent in 1994 to 17.1 percent in 1999. The aggregate data mask significant shifts in the rate of consumption of different fabric types. As shown in tables 5 and 6, the steepest declines in consumption occurred in fabrics used largely in apparel, such as printcloth, broadcloth, and wool fabrics. Denim, which accounts for a large share of the domestic apparel fabric market, benefitted from strong consumer demand for jeans and other denim goods during 1994-98, when apparent consumption of denim grew at an annual average rate of 3 percent, before declining by 21 percent in 1999. The decline in 1999 was attributed to overcapacity in the North American and global denim market.<sup>73</sup> Apparent U.S. consumption of fabric made with 85 percent or more manmade filament yarn grew at an annual average rate of 2.5 percent. Almost 70 percent of this fabric is believed to be used for carpet backing, a relatively low value-added fabric.<sup>74</sup>

**Table 4**  
**Broadwoven fabrics: U.S. producers' shipments, exports of domestic merchandise, imports for consumption, and apparent consumption, 1994-99**

Year	U.S. producers'			Apparent U.S. consumption	Ratio of imports to consumption
	shipments <sup>1</sup>	U.S. imports	U.S. exports		
	—Million dollars—				Percent
1994 .....	19,934	3,413	1,821	21,527	15.9
1995 .....	20,237	3,518	1,974	21,782	16.2
1996 .....	19,805	3,448	2,156	21,097	16.3
1997 .....	20,368	3,863	2,322	21,909	17.6
1998 .....	21,512	3,864	2,357	23,019	16.8
1999 .....	20,162	3,618	2,617	21,163	17.1

<sup>1</sup> Shipments data consist of U.S. product shipments of broadwoven fabrics of cotton, manmade fibers, and wool, plus product shipments for finished broadwoven fabrics (not finished in weaving mills), minus commission finishing. For 1994-96, the estimated value of converter shipments was added to finishing to make the data correspond more closely with the data reported under the NAICS. Data for 1999 are estimated by USITC staff based on U.S. production of broadwoven fabrics as reported by the U.S. Census Bureau in CIR: Broadwoven Fabrics (MQ313T) and the producer price index for broadwoven fabrics as reported by the U.S. Bureau of Labor Statistics.

Source: Compiled from official statistics of the U.S. Census Bureau, 1998 Annual Survey of Manufactures and selected back issues, 1997 Economic Census: Broadwoven Fabric Mills and Broadwoven Fabric Finishing Mills, and official statistics of the U.S. Department of Commerce, except as noted.

<sup>73</sup> John S. Pickler and Brenda B. Lowry, *Textiles & Apparel Industry Update*, Prudential Securities, May 24, 1999, p. 1, and Cone Mills Corp., 10-K Form filed with the SEC on Apr. 4, 1999.

<sup>74</sup> Estimated by the Commission based on official statistics of the U.S. Census Bureau, *CIR: Broadwoven Fabrics*, MQ313T, 1999-3, and prior issues.

**Table 5**  
**Broadwoven fabrics: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, by fibers, 1994-99**

Item and year	U.S.	U.S.	U.S.	Apparent U.S.	Ratio of imports to
	production	imports <sup>1</sup>	exports	consumption	consumption
	<i>Million square meters</i>				<i>Percent</i>
Cotton fabric:					
1994 .....	3,740	1,589	247	5,082	31.3
1995 .....	3,753	1,485	278	4,960	29.9
1996 .....	4,010	1,326	279	5,057	26.2
1997 .....	4,246	1,591	301	5,537	28.7
1998 .....	3,974	1,563	309	5,228	29.9
1999 .....	3,721	1,441	410	4,752	30.3
Manmade fiber fabric:					
1994 .....	9,999	893	315	10,577	8.4
1995 .....	9,858	839	335	10,362	8.1
1996 .....	9,522	888	388	10,023	8.9
1997 .....	9,794	1,027	442	10,379	9.9
1998 .....	9,616	1,108	449	10,275	10.8
1999 .....	9,887	1,087	480	10,494	10.4
Wool fabric:					
1994 .....	149	30	8	171	17.5
1995 .....	136	27	9	153	17.6
1996 .....	127	27	11	144	18.9
1997 .....	147	31	13	165	18.8
1998 .....	111	33	15	128	25.5
1999 .....	65	34	13	86	39.5
Total:					
1994 .....	13,888	2,512	570	15,830	15.9
1995 .....	13,746	2,351	622	15,475	15.2
1996 .....	13,660	2,241	677	15,224	14.7
1997 .....	14,187	2,650	756	16,080	16.5
1998 .....	13,701	2,704	773	15,631	17.3
1999 .....	13,673	2,562	903	15,332	16.7

<sup>1</sup> The import data shown in this table differ from those in table 8 of this report because the data come from two different sources. The import data in this table (table 5), along with the production, export, and consumption data, were compiled from a U.S. Census Bureau publication (as noted below), and are presented here to show the relative importance of the U.S. market for fabrics, by fibers. The import data in table 8 were compiled by the Commission, using its own HTS import concordances, from official statistics of the U.S. Department of Commerce.

Source: U.S. Census Bureau, CIR: Broadwoven Fabrics (MQ313T, formerly MQ22-T), 1994-99, table 11.

**Table 6**  
**Broadwoven fabrics: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, by selected fabrics, 1994-99**

Item and year	U.S.	U.S.	U.S.	Apparent U.S.	Ratio of
	production <sup>1</sup>	imports	exports <sup>2</sup>	consumption	imports to consumption
	<i>Million square meters</i>				<i>Percent</i>
Manmade fiber, 85 percent or more of filament yarn:					
1994 .....	5,070	443	170	5,343	8.3
1995 .....	5,103	445	187	5,361	8.3
1996 .....	5,074	565	223	5,416	10.4
1997 .....	5,365	581	251	5,695	10.2
1998 .....	5,186	586	250	5,522	10.6
1999 .....	5,668	643	257	6,054	10.6
Cheesecloth and batistes of cotton and manmade-fiber spun yarn:					
1994 .....	801	46	29	818	5.6
1995 .....	839	46	29	856	5.4
1996 .....	1,183	53	28	1,207	4.4
1997 .....	1,245	66	33	1,277	5.1
1998 .....	727	83	29	781	10.6
1999 .....	733	60	26	767	7.8
Printcloth of cotton and manmade-fiber spun yarn: <sup>3</sup>					
1994 .....	1,255	445	41	1,659	26.8
1995 .....	1,133	401	43	1,491	26.9
1996 .....	987	313	42	1,258	24.9
1997 .....	962	399	36	1,324	30.1
1998 .....	912	384	57	1,239	31.0
1999 .....	732	335	64	1,003	33.0
Sheeting of cotton and manmade-fiber spun yarn:					
1994 .....	2,121	371	72	2,420	15.3
1995 .....	2,168	316	70	2,414	13.1
1996 .....	2,103	265	72	2,295	11.5
1997 .....	2,107	273	82	2,298	11.9
1998 .....	2,244	263	80	2,428	10.8
1999 .....	2,252	238	90	2,400	9.9
Poplin and broadcloth of cotton and manmade-fiber yarn: <sup>3</sup>					
1994 .....	866	456	265	1,057	43.1
1995 .....	856	306	49	1,113	27.5
1996 .....	810	243	32	1,021	23.8
1997 .....	800	243	30	1,013	24.0
1998 .....	757	434	55	1,136	38.2
1999 .....	708	369	58	1,019	36.2
Twill and sateens (except denim) of cotton and manmade-fiber spun yarn:					
1994 .....	911	282	41	1,152	24.4
1995 .....	873	239	46	1,066	22.4
1996 .....	867	209	56	1,020	20.5
1997 .....	1,068	273	70	1,270	21.5
1998 .....	1,097	283	80	1,300	21.8
1999 .....	1,066	293	113	1,246	23.5

See footnotes at end of table.

**Table 6—Continued**

**Broadwoven fabrics: U.S. production, imports for consumption, exports of domestic merchandise, and apparent consumption, by selected fabrics, 1994-99**

Item and year	U.S.	U.S.	U.S.	Apparent U.S.	Ratio of
	production <sup>1</sup>	imports	exports <sup>2</sup>	consumption	imports to consumption
	<i>Million square meters</i>				<i>Percent</i>
Blue denim of cotton:					
1994 .....	687	109	87	709	15.4
1995 .....	729	174	97	806	21.5
1996 .....	707	176	109	774	22.7
1997 .....	703	167	122	748	22.3
1998 .....	794	153	135	812	18.9
1999 .....	675	139	172	642	21.7

<sup>1</sup> Production data for fabrics of manmade-fiber spun yarns were based on data from CIR: Broadwoven Fabrics, (MQ313T), 1999 and prior issues, table 3.

<sup>2</sup> Exports of manmade fiber fabrics estimated by the Commission.

<sup>3</sup> Includes spun filament yarn combinations.

Source: U.S. Census Bureau, CIR: Broadwoven Fabrics, (MQ313T, formerly MQ22-T), 1994-1999, table 11, unless otherwise noted.

## Production

U.S. producers' shipments of broadwoven fabrics increased by about 1 percent during 1994-99 to \$20.2 billion.<sup>75</sup> Slightly more than 70 percent of U.S. broadwoven fabric production by quantity is chiefly of manmade fibers. Although aggregate production levels remained relatively steady during 1994-99, significant changes occurred among fabrics. Production of blue denim and other twills increased during 1994-98, reflecting consumer demand for more casual wear. Production of certain other fabrics used chiefly in apparel, such as printcloth, poplin and broadcloth, and wool fabric, declined during 1994-99. During this period, U.S. companies decreased domestic apparel fabric production capacity, either by shutting down certain apparel fabric operations or shifting production to other types of fabric. Production of manmade-filament yarn fabric increased by 12 percent during the period.

<sup>75</sup> Production data for sheeting fabric include large quantities used internally by mills to make bedsheets and other home furnishings. Therefore, much of the sheeting fabric that is included in production data for the broadwoven fabrics industry is not included in the data on broadwoven fabric shipments.

# U.S. TRADE

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Total U.S. trade in broadwoven fabrics increased continually during 1994-99, rising by 19 percent to \$6.2 billion. The increase largely reflected steady growth in exports, which grew by 44 percent to a high of \$2.6 billion. Imports remained fairly stable at an average of about \$3.5 billion per year during 1994-96, accelerated to a record \$3.9 billion in 1997 and 1998, and then fell to \$3.6 billion in 1999. As a result, the U.S. trade deficit in broadwoven fabrics narrowed significantly in 1999, to \$1.0 billion, after averaging \$1.5 billion in 4 of the preceding 5 years (table 7).

The pattern of U.S. trade in broadwoven fabrics during 1994-99 mainly reflected shifts in trade with NAFTA partners Canada and Mexico, the principal export markets, and Asia, the largest import source. These trading partners together accounted for 71 percent of the trade in 1999. Since the implementation of NAFTA in 1994, the U.S. trade surplus with the NAFTA partners more than doubled to \$1.2 billion in 1999, as both U.S. exports and U.S. imports more than doubled to \$1.7 billion and \$0.6 billion, respectively. The Caribbean Basin Economic Recovery Act (CBERA) countries make up the only other region with which the United States posted a trade surplus in broadwoven fabrics (\$185 million in 1999). U.S. broadwoven fabric exports to Mexico and CBERA countries (e.g., Costa Rica, the Dominican Republic, Guatemala, El Salvador, and Honduras) consisted mostly of fabrics for use in the production of apparel for export to the United States.

The U.S. trade deficit in broadwoven fabrics with Asia widened from \$1.6 billion in 1994 to \$1.9 billion in 1998, and then narrowed to \$1.7 billion in 1999. Imports from Asia rose from \$1.8 billion a year during 1994-96 to highs of almost \$2.1 billion in 1997 and 1998, before declining to \$1.9 billion in 1999.

Exports to Asia fell sharply from an average of about \$245 million a year during 1994-97 to \$179 million in 1999. The record U.S. import levels of 1997-98 and the reduced U.S. export levels of 1998-99 largely reflected the effects of the Asian financial crisis of mid-1997 to early 1998, as weak economic activity in East Asia led to reduced demand for foreign goods and increased efforts to boost exports to earn much needed foreign exchange.<sup>76</sup> At the same time, the significant currency devaluations of several Asian countries effectively reduced U.S. dollar prices of their goods in the U.S. market, but increased U.S. export prices in Asian markets.

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<sup>76</sup> See, for example, ATMI, "International Trade," *Textile HiLights*, Dec. 1998, pp. i-v, and "Low Cost Imports Still Staggering Industry," *Southern Textile News*, June 7, 1999, p. 12. 35

Table 7

## Broadwoven fabrics: U.S. exports of domestic merchandise, imports for consumption, and trade balance for selected countries and country groups, 1994-99

Item	(1,000 dollars)					
	1994	1995	1996	1997	1998	1999
U.S. exports of domestic merchandise:						
Italy .....	26,346	27,449	34,343	34,135	39,373	32,944
Canada .....	415,393	455,873	481,931	553,479	574,409	528,116
Korea .....	35,332	36,485	24,432	19,794	17,646	21,543
China .....	9,777	13,570	13,157	18,131	16,802	20,156
India .....	1,942	2,252	3,381	5,416	7,423	6,191
Mexico .....	305,794	309,715	433,787	479,175	593,980	1,216,884
Pakistan .....	131	307	233	158	137	368
Japan .....	47,550	45,647	39,647	33,311	26,097	21,970
Hong Kong .....	66,306	63,712	65,053	81,855	63,883	54,858
Taiwan .....	21,692	22,419	20,906	22,755	17,669	9,290
All other .....	890,462	996,501	1,039,268	1,073,979	999,633	704,759
Total .....	1,820,725	1,973,930	2,156,138	2,322,188	2,357,052	2,617,079
EU-15 .....	370,882	409,030	411,626	399,476	389,136	264,900
Asia .....	240,148	251,579	234,370	252,843	196,110	179,191
NAFTA .....	721,187	765,588	915,718	1,032,654	1,168,389	1,745,000
CBERA .....	176,927	195,392	222,708	242,565	280,012	189,359
U.S. imports for consumption:						
Italy .....	448,569	434,323	429,077	421,872	422,135	382,804
Canada .....	207,163	262,927	293,794	333,308	350,589	335,727
Korea .....	374,746	403,976	389,094	380,403	342,186	333,963
China .....	233,808	222,727	232,236	377,822	318,122	314,572
India .....	169,364	212,321	230,776	266,936	258,182	222,133
Mexico .....	51,961	140,944	196,650	255,674	248,881	242,902
Pakistan .....	128,004	152,928	138,117	200,098	240,202	192,481
Japan .....	378,746	273,584	260,775	274,300	240,139	215,365
Hong Kong .....	122,146	118,281	108,201	115,932	143,377	151,471
Taiwan .....	166,965	172,785	167,050	143,028	136,918	170,565
All other .....	1,131,694	1,123,385	1,002,006	1,093,689	1,163,177	1,056,133
Total .....	3,413,166	3,518,181	3,447,778	3,863,063	3,863,908	3,618,116
EU-15 .....	864,291	835,607	818,791	829,174	842,511	786,358
Asia .....	1,850,836	1,830,773	1,780,427	2,086,418	2,052,288	1,925,576
NAFTA .....	252,665	398,707	486,074	583,350	595,190	575,044
CBERA .....	13,232	11,096	8,392	6,056	4,961	4,302
U.S. trade balance:						
Italy .....	-422,223	-406,874	-394,734	-387,737	-382,762	-349,860
Canada .....	208,230	192,946	188,137	220,171	223,820	192,389
Korea .....	-339,414	-367,491	-364,662	-360,609	-324,540	-312,420
China .....	-224,031	-209,157	-219,079	-359,691	-301,320	-294,416
India .....	-167,422	-210,069	-227,395	-261,520	-250,759	-215,942
Mexico .....	253,833	168,771	237,137	223,501	345,099	973,892
Pakistan .....	-127,873	-152,621	-137,884	-199,940	-240,065	-192,113
Japan .....	-331,196	-227,937	-221,128	-240,989	-214,042	-193,395
Hong Kong .....	-55,840	-54,569	-43,148	-34,077	-79,494	-96,613
Taiwan .....	-145,273	-150,366	-146,144	-120,273	-119,249	-161,275
All other .....	-241,232	-126,884	37,262	-19,710	-163,544	-351,374
Total .....	-1,592,441	-1,544,251	-1,291,640	-1,540,875	-1,506,856	-1,001,037
EU-15 .....	-493,409	-426,577	-407,165	-429,698	-453,375	-521,458
Asia .....	-1,610,688	-1,579,194	-1,546,057	-1,833,575	-1,856,178	-1,746,385
NAFTA .....	486,522	366,881	429,644	449,304	573,199	1,169,956
CBERA .....	163,695	184,296	214,316	236,509	275,051	185,057

Source: Compiled from official statistics of the U.S. Department of Commerce.

World trade in textiles, including fabrics, will become less restricted as a result of the phaseout of quotas by the United States and other importing countries (see “U.S. trade measures” for further information). Such trade liberalization will likely strengthen the competitiveness of developing countries that have the capability to establish a significant presence in the U.S. fabric market. These developing countries benefit from access to low-cost labor inputs.

## **U.S. Imports**

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U.S. imports of broadwoven fabrics declined by 12 percent by quantity but remained relatively steady by value during 1994-96. U.S. imports rose in terms of both quantity and value in 1997 and 1998, before falling again in 1999. The drop in import volume during 1994-96 is thought to reflect a drop in U.S. demand for apparel fabrics. The increases in U.S. imports in 1997 and 1998 are largely attributable to an increase in domestic demand for home textile fabrics and, most importantly, the effects of the financial crisis in Asia, which supplied 53 percent of the value but 69 percent of the quantity of U.S. broadwoven fabric imports in 1999. The greatest changes in trade occurred with the East Asian countries that had devalued their currencies, led by the Association of Southeast Asian Nations (ASEAN), whose shipments grew by 48 percent in quantity during 1996-98. Imports from other Asian countries, especially India, Pakistan, and China, also increased. In particular, the quantity of U.S. imports from Pakistan nearly doubled, making Pakistan the leading U.S. supplier of broadwoven fabric in 1998.

Other major sources of U.S. broadwoven fabric imports are the NAFTA countries, whose shipments nearly doubled in quantity during 1994-99, while their share of the total import quantity doubled to 16 percent (figure 5). The increase can be attributed to the preferential trade status enjoyed by NAFTA countries (see Preferential Trade Programs) and to increased investment in fabric production in Mexico (see Foreign Industry Profile). In contrast, U.S. broadwoven fabric imports from the European Union (EU) declined during 1994-99. In general, the price of EU fabrics is significantly higher than that of fabrics from most Asian countries. For example, broadwoven fabrics from Italy averaged \$5.09 per square meter in 1999, compared with less than \$1 for those from Pakistan, China, and India.

An estimated 70 percent of U.S. imports of broadwoven fabrics were intended for the apparel market in 1999. The remainder is split roughly between the home textile and industrial markets. U.S. apparel fabric imports have been declining in response to decreased U.S. demand for apparel fabrics. Since 1996, the decline in apparel fabric imports has been offset in part by increases in fabric imports intended for other markets, particularly home textiles. In fact, some imported fabrics traditionally used for apparel are now increasingly being used for home textile applications. For example, imported broadcloth, a fabric traditionally used for men’s shirts, is now being used to make bedsheets.<sup>77</sup>

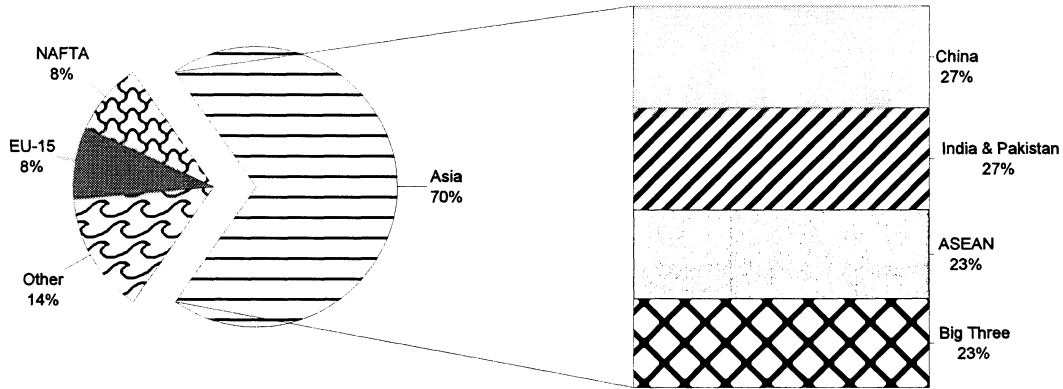
Broadwoven fabrics of cotton made up 56 percent of the total volume of U.S. broadwoven fabric imports in 1999, compared with 27 percent of U.S. production (see table 5). China, Pakistan and India were the top three foreign suppliers, together accounting for 47 percent

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<sup>77</sup> Data estimated by the Commission based on information from Charles Bremer, Director, International Trade, ATMI, telephone interview by USITC staff, Feb. 29, 2000.

**Figure 5**  
**Broadwoven fabrics:<sup>1</sup> Percentage distribution of U.S. imports, by sources, 1994 and 1999**

1994 total imports: 2.9 billion square meters



<sup>1</sup> Includes fabrics of cotton, other vegetable fibers, manmade fibers, wool, silk, and glass fibers.

<sup>2</sup> Big Three are Hong Kong, Taiwan, and Korea.

Source: Compiled from official statistics of the U.S. Department of Commerce.

of U.S. cotton fabric imports in 1999 (table 8). Slightly more than two-thirds of the total volume of U.S. broadwoven cotton fabric imports were grey (unfinished) fabrics,<sup>78</sup> which afford the importer or end-user flexibility in finishing the fabric based on market demand.

Wool fabrics account for a relatively small share of the total volume and value of broadwoven fabric imports (1 percent and 6 percent, respectively, in 1999). In general, U.S. tariff rates on wool fabrics are higher than those for fabrics of other fibers (see tariff measures) and the quotas are generally smaller than those for other fibers. Nevertheless, there are no quotas on U.S. wool fabric imports from the top three suppliers, Italy, Mexico and Canada, and U.S. tariffs have been eliminated on originating goods of Canada and of Mexico under NAFTA.<sup>79</sup> The average unit value for U.S. imports of wool fabrics is generally higher than for most other imported broadwoven fabrics, with the unit value for imported wool fabrics averaging almost \$7 per square meter, compared with about \$1 per square meter for imported cotton and manmade fiber fabrics.

<sup>78</sup> Similar data are not available for manmade-fiber and wool fabric.

<sup>79</sup> Only those fabrics that meet the NAFTA rules of origin requirements are eligible for duty-free treatment. As of January 1, 2001, the only “non-originating” fabrics from Mexico still subject to a designated consultation level (a type of quota limitation) are woven fabrics of wool and of artificial staple fibers.



**Table 8**  
**Broadwoven fabrics: U.S. imports for consumption, by fiber types and principal countries, 1994-99**

<i>1,000 square meters</i>						
Product and country	1994	1995	1996	1997	1998	1999
Cotton fabrics .....	1,590,778	1,487,269	1,320,148	1,592,462	1,629,654	1,540,035
China .....	303,165	257,853	210,342	286,890	225,144	285,937
Pakistan .....	172,511	193,402	192,574	268,995	304,970	260,520
India .....	139,743	152,968	203,711	220,019	197,204	171,742
Thailand .....	84,913	66,116	69,643	87,596	132,439	126,342
Mexico .....	24,778	69,443	91,078	129,474	140,003	151,581
Manmade fiber fabrics .....	1,011,885	945,399	937,361	1,118,086	1,213,141	1,148,288
Canada .....	115,343	155,559	154,937	165,410	175,208	192,992
Korea .....	114,033	129,868	129,052	125,784	123,219	133,206
Japan .....	169,608	89,766	92,695	106,508	111,403	102,251
Pakistan .....	90,280	60,904	41,606	105,233	146,024	97,839
Thailand .....	71,050	67,605	62,676	64,465	77,429	75,864
Wool fabrics .....	27,349	25,512	25,461	29,671	30,438	31,615
Italy .....	6,710	6,589	6,962	7,873	8,158	7,286
Mexico .....	673	1,243	2,134	3,053	3,144	6,858
Canada .....	3,056	3,540	3,621	5,069	4,437	4,222
Korea .....	2,477	1,874	1,049	992	1,705	2,338
India .....	292	338	450	1,277	1,600	1,450
Silk and vegetable fiber fabrics .....	218,163	240,744	159,899	235,258	214,926	213,186
India .....	63,442	92,641	74,018	158,473	101,953	81,206
Bangladesh .....	89,378	90,015	27,583	10,434	39,490	56,234
China .....	18,647	14,429	19,058	25,673	26,184	27,056
Russia .....	2,246	1,637	2,618	4,660	6,587	12,418
Belarus .....	517	835	836	3,680	7,740	7,423
Glass fiber fabrics .....	42,991	42,234	109,639	43,056	49,049	76,851
Canada .....	21,442	19,682	24,722	26,444	35,846	47,133
Belarus .....	141	19	52	420	1,853	13,424
France .....	6,710	6,108	66,791	4,550	5,185	5,482
Germany .....	5,579	4,556	6,144	3,288	664	4,610
Japan .....	3,331	4,276	4,412	4,220	2,455	3,082

Source: Compiled from official statistics of the U.S. Department of Commerce.

## *U.S. Trade Measures*

The primary U.S. trade measures affecting broadwoven fabrics are import tariffs and quotas.<sup>80</sup> The United States is reducing tariffs and phasing out quotas over a 10-year period, as required under the Uruguay Round Agreements (URA) that entered into force as part of the World Trade Organization (WTO) agreements in 1995.<sup>81</sup>

### **Tariffs**

Broadwoven fabrics are classified for tariff purposes under 220 subheadings of the Harmonized Tariff Schedule of the United States (HTS), depending on such factors as fiber content, yarn size and type, and fabric weight, finish, and weave.<sup>82</sup> The rates of duty in effect during 1999 ranged from a trade-weighted average of less than 1 percent ad valorem for silk and linen fabrics to 9.0 percent for cotton fabrics, 15.2 percent for manmade-fiber fabrics, and 24.4 percent for wool fabrics.<sup>83</sup> The trade-weighted rate of duty for all broadwoven fabrics averaged 10.8 percent ad valorem in 1999, down from 12.4 percent in 1994. Under the URA, the United States agreed to reduce tariffs on these fabrics by a trade-weighted 27 percent, to an average duty rate of 8.7 percent ad valorem by 2004. The average tariffs for wool fabrics (which have the highest tariffs among broadwoven fabrics) will be reduced from more than 36 percent ad valorem in 1994 to 25 percent ad valorem in 2004.

### **Quotas**

World trade in textiles and apparel had been largely governed by the terms of the 1974 Multifiber Arrangement (MFA), which permitted the use of quotas without compensation.<sup>84</sup> On January 1, 1995, the Uruguay Round Agreement on Textiles and Clothing (ATC) entered

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<sup>80</sup> See appendix B for an explanation of tariff and trade agreement terms.

<sup>81</sup> The URA represented the culmination of negotiations among 125 countries over an 8-year period launched in Punta del Este, Uruguay in 1986. On April 15, 1994, the URA was signed in Marrakesh, Morocco by 111 countries, including the United States. The URA, among other things, cut global tariffs by more than one-third and will reduce or eliminate nontariff measures such as quotas. See U.S. House of Representatives, Committee on Ways and Means, *Overview and Compilation of U.S. Trade Statutes*, 105th Cong., 1st sess. (Washington, DC: U.S. Government Printing Office, 1997), WMCP 105-4, pp. 195-199.

<sup>82</sup> For example, the year 2000 tariff rates for cotton oxford cloth, typically used for men's dress shirts, range between 7 percent and 14.7 percent ad valorem, depending on the yarn number, the finish, and whether or not the fabric was made entirely of cotton or a blend of cotton and manmade fibers.

<sup>83</sup> The NAFTA countries were excluded for the purposes of this calculation, because most broadwoven fabric imports from these countries entered free of duty in 1999 under the provisions of NAFTA.

<sup>84</sup> The MFA, negotiated under auspices of the General Agreement on Tariffs and Trade (GATT), provided a general framework and guiding principles for negotiation of bilateral agreements between textile importing and exporting countries for the purpose of setting quotas, or for unilateral action by an importing country if an agreement could not be reached. The MFA was designed to deal with problems of market disruption in textile trade in developed countries, while permitting developing countries to share in expanded export opportunities.

into force as part of the WTO agreements and replaced the MFA. The ATC provides for the elimination of the quotas and complete “integration” of textiles and apparel into the WTO regime (i.e., subject to the same rules as trade in other sectors) over a 10-year transition period ending on January 1, 2005. All WTO countries are subject to ATC disciplines, and only WTO countries are eligible for ATC benefits, including quota elimination. The WTO countries with import quotas to phase out under the ATC are the United States, EU, Canada, and Norway.

The phaseout of quotas under the ATC involves (1) the integration of products into the WTO regime, including the removal of quotas on those goods,<sup>85</sup> and (2) the acceleration of growth rates for expanding quotas still in place during the transition period on goods not yet integrated into the WTO regime (the “growth-on-growth” provision). The ATC required WTO members to integrate at least 16 percent of their textile and apparel trade into the WTO regime on January 1, 1995, and an additional 17 percent on January 1, 1998 (based on their respective 1990 import volumes). The countries are to integrate at least another 18 percent of the trade in 2002 and the remainder on January 1, 2005. Table 9 shows the schedule of integration for broadwoven fabrics. The growth-on-growth provision required importing countries to increase existing quota growth rates for major supplying countries by 16 percent in 1995 and by an additional 25 percent in 1998; it requires them to increase the growth rates by another 27 percent in 2002.<sup>86</sup> For small suppliers (i.e., countries accounting for 1.2 percent or less of an importing country’s total quotas in 1991), quota growth rates were accelerated by one stage—that is, they were increased by 25 percent in 1995 and by 27 percent in 1998.

During the 10-year transition period, the ATC also allows WTO members to set new quotas on imports of articles not yet integrated into the WTO regime by applying a “transitional safeguard” when imports cause or threaten serious damage to a domestic industry. These quotas may remain in place for up to 3 years during the transition period or until the item is integrated into the WTO regime. The United States did not initiate any safeguard actions under the ATC for broadwoven fabrics during 1995-99.

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<sup>85</sup> As products are integrated into the WTO regime, quotas on the integrated articles automatically become void and no new quotas may be imposed upon such goods unless there has been a determination of serious injury under GATT article XIX, the safeguards provision. See U.S. House of Representatives, Committee on Ways and Means, *Overview and Compilation of U.S. Trade Statutes*, 105th Cong., WMCP 105-4, p. 120.

<sup>86</sup> The growth-on-growth provision applies to quota growth rates specified in the bilateral MFA agreements in place on Dec. 31, 1994. The base rates by which the quotas could grow annually vary by country and product, but usually ranged from less than 1 percent to 6 percent; some countries had base rates of 7 percent. Assuming a base rate of 6 percent for a major supplier, the quota would be increased by 6.96 percent a year in stage one (1995-97), 8.7 percent a year in stage two (1998-2001), and 11.05 percent a year in stage three (2002-04).

**Table 9**  
**Broadwoven fabrics: Schedule of integration into the WTO**

Integration phase	Date of integration	Description of fabrics integrated in each phase
Phase 1	January 1, 1995	<ul style="list-style-type: none"> <li>•Hand-loomed cotton fabric</li> <li>•Silk fabric</li> <li>•Coarse animal hair fabric</li> <li>•Fabric of jute or other bast fibers</li> <li>•Fabric of paper yarn</li> </ul>
Phase 2	January 1, 1998	<ul style="list-style-type: none"> <li>•Fabric of metallized yarn</li> </ul>
Phase 3	January 1, 2002	<ul style="list-style-type: none"> <li>•Fabrics of other vegetable fibers (including linen fabric)</li> <li>•Silk-blended fabric</li> <li>•Glass fiber fabric</li> <li>•Typewriter ribbon fabric</li> </ul>
Phase 4	January 1, 2005	<ul style="list-style-type: none"> <li>•All remaining broadwoven fabrics (e.g., most cotton, wool, and manmade fiber fabrics)</li> </ul>

Source: Committee for the Implementation of Textile Agreements (chaired by the U.S. Department of Commerce), First Integration of Textile and Apparel Products into GATT 1994 and Final List of Products for Second, Third, and Final Phase Integration of Textile and Apparel Products into GATT 1994, found at Internet address <http://otexa.ita.doc.gov/fedreg/>, retrieved Oct. 12, 1999.

In 1999, the United States had import quotas on broadwoven fabrics from 25 countries, which together accounted for 59 percent of the total value of MFA-covered broadwoven fabric imports. Of these quota countries, 22 are WTO members for which the United States is phasing out quotas, under either NAFTA (Mexico) or the ATC. The three non-WTO countries subject to U.S. quotas, China, Taiwan, and Belarus, are ineligible for quota liberalization under the ATC. In November 1999, the United States signed a market access agreement with China which, should China accede to the WTO, obligates the United States to phase out quotas on imports of Chinese textiles and apparel as of January 1, 2005, the same date as that for other WTO members.<sup>87</sup> However, the agreement allows the United States to apply selective safeguards (quotas) on imports of such goods for four additional years beyond the termination of textile quotas for WTO members—that is, from January 1, 2005 to December 31, 2008. The agreement also states that no safeguards established during the 4-year period will remain in effect beyond 1 year, without re-application, unless both countries agree.

Broadwoven fabrics are reported for quota purposes in 31 textile categories, depending on fiber content and fabric type. Although no country is subject to quota under each of the categories (e.g., China was subject to quotas in 14 categories in 1999), some countries, including two of the largest suppliers, China and India, are subject to group quotas that cover a wide range of goods, including fabrics. Table 10 shows the quota levels and fill rates

<sup>87</sup> The agreement incorporates the text of an agreement contained in a Memorandum of Understanding (MOU) between the United States and China of February 1, 1997, which provides that should China become a member of the WTO, the United States would grant China the same benefits on the same schedule accorded other WTO textile-exporting countries under the ATC<sub>42</sub>

by supplier country for broadwoven fabrics of cotton (category 313, cotton printcloth), manmade fiber (category 620, other synthetic filament fabric) and wool (category 410, woven wool fabric), which accounted for the largest volume of broadwoven fabric imports in 1999 within their respective fiber classifications. As shown in table 10, the quota levels vary considerably by type of fabric, and by country.

The United States initiated one request for consultations with a foreign supplying country during 1994-99 for the purpose of establishing a quota on certain broadwoven fabrics. In 1999, the United States requested consultations under the authority of section 204 of the Agricultural Act of 1956 with Belarus, a non-WTO country, for the purpose of establishing a quota on U.S. imports of glass fiber fabric (textile category 622) from that country. An agreement was reached in February 2000, which limits U.S. imports of glass fabrics from Belarus at an annual level of 11.5 million square meters for the year 2000.<sup>88</sup> In addition, the parties agreed to a sublimit of 1,000,000 square meters on glass fabric weighing 185 grams or less. U.S. imports of glass fabrics from Belarus reached 13.4 million square meters in 1999, up from 1.8 million square meters in 1998.

### ***NAFTA and Other Preferential Trade Programs***

NAFTA entered into force on January 1, 1994, and provided for the elimination of duties on “originating” goods traded among the United States, Canada, and Mexico.<sup>89</sup> As of January 1, 1998, the United States and Canada phased out all tariffs on bilateral trade in originating textile articles.<sup>90</sup> For Mexico, U.S. tariffs on most originating fabrics were phased out as of January 1, 1999; the remainder will be phased out in 2003. The United States eliminated quotas on all originating textile articles from Mexico upon implementation of NAFTA, and will eliminate quotas on “nonoriginating” goods (goods that do not meet NAFTA origin rules) as of January 1, 2004.

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<sup>88</sup> Committee for the Implementation of Textile Agreements, “Settlement of a Call and Establishment of an Import Limit for Certain Man-Made Fiber Textile Products Produced or Manufactured in Belarus,” *Federal Register* (65 F.R. 15315), Mar. 22, 2000, p. 15315.

<sup>89</sup> NAFTA trade preferences apply to goods that “originate” in the United States, Canada, and Mexico—that is, the goods meet the NAFTA rules of origin to be eligible for tariff preferences. For most broadwoven fabrics, the NAFTA origin rule is a “yarn forward” rule, whereby the fabrics must be made in a NAFTA country from the yarn-formation stage forward to receive the tariff preferences. For some fabrics, a fiber forward rule applies.

<sup>90</sup> The phaseout of tariffs on trade between the United States and Canada began in 1989, when the United States-Canada Free-Trade Agreement (CFTA) entered into force. With the implementation of NAFTA in 1994, the CFTA was suspended and its duty phaseout schedule was incorporated into NAFTA.

**Table 10**  
**U.S. import quotas and fill rates on selected textile categories, 1999**

Country	Category 313-Cotton printcloth		Category 620-Other synthetic filament fabric		Category 410-Woven wool fabric	
	Quota	Fill rate	Quota	Fill rate	Quota	Fill rate
	Square meters	Percent	Square meters	Percent	Square meters	Percent
Brazil	27,894,932	2.4	( <sup>1</sup> )	( <sup>1</sup> )	2,735,601	27.2
Bulgaria	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	850,058	2.5
China	137,772,168	94.3	( <sup>2</sup> )	( <sup>2</sup> )	1,078,970	<sup>3</sup> 73.3
Colombia	25,919,294	0.1	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Czech Republic	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	1,616,155	6.3
Egypt	32,844,943	0	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Hong Kong	10,469,698	3.0	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Hungary	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	950,751	0
India	14,508,208	46.1	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Indonesia	29,512,104	61.1	<sup>4</sup> 10,472,294	76.1	( <sup>2</sup> )	( <sup>1</sup> )
Korea	18,670,186	<sup>2</sup> 48.2	<sup>4</sup> 104,534,265	<sup>2</sup> 91.1	3,603,292	<sup>2</sup> 63.7
Macau	3,927,934	0	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Malaysia	37,384,140	14.7	7,467,484	91.5	( <sup>2</sup> )	( <sup>1</sup> )
Mexico <sup>5</sup>	6,966,904	0	( <sup>1</sup> )	( <sup>1</sup> )	397,160	16.4
Pakistan	87,320,778	50.8	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Poland	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	2,731,797	1.5
Romania	3,575,141	0	( <sup>1</sup> )	( <sup>1</sup> )	99,740	8.3
Slovak Republic	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	422,051	1.6
Taiwan	21,741,546	( <sup>6</sup> )( <sup>2</sup> )	<sup>4</sup> 15,490,147	<sup>2</sup> 92.4	( <sup>2</sup> )	( <sup>1</sup> )
Thailand	34,440,612	77.8	7,899,539	87.7	( <sup>1</sup> )	( <sup>1</sup> )
Turkey	47,739,262	0.5	( <sup>1</sup> )	( <sup>1</sup> )	885,669	75.4
United Arab Emirates	<sup>7</sup> 0	0	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )
Uruguay	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )	2,950,531	27.8

<sup>1</sup> No quota in effect.

<sup>2</sup> Imports under this textile category were subject to a group quota that was 90 percent or more filled in 1999.

<sup>3</sup> A sublimit on category 410-B, wool fabric made with combed wool (worsted wool fabric) was more than 90 percent filled in 1999.

<sup>4</sup> Represents quota for merged categories 619/620, polyester filament fabric and other synthetic filament fabric.

<sup>5</sup> The quota for imports from Mexico is a designated consultation level and applies to imports from Mexico of non-originating textile goods.

<sup>6</sup> Less than 0.5 percent.

<sup>7</sup> The quota was agreed to as part of a bilateral agreement between the United States and the UAE in an effort to prevent transshipments of this product from a third country through the UAE to the United States. The UAE reportedly does not produce this fabric.

Note.—The quota shown reflects the quota level in place as of December 31, 1999, as reported by the U.S. Customs Service. The quota may have been increased or decreased from the original level to accommodate requests for flexibility from the supplying country.

Source: Compiled from data in "U.S. Customs Service Textiles Status Report" for 1999, found at Internet address <http://www.customs.ustreas.gov/quotas/1999/trttrpt.htm>, retrieved Feb. 17, 2000.

The United States also has a free-trade agreement with Israel and, on October 24, 2000, signed one with Jordan. Under the 1985 United States-Israel Free-Trade Area Agreement, the two countries phased out all tariffs and quotas on eligible bilateral trade in textile and other industrial products over a 10-year period. U.S. imports of broadwoven fabrics under the agreement were valued at \$30 million in 1999, accounting for 0.8 percent of total broadwoven fabric imports. Under the agreement with Jordan, which is scheduled to enter into force 2 months after both parties exchange written notification that they have completed the necessary domestic legal procedures for implementing the agreement,<sup>91</sup> the two countries will eliminate duties on eligible trade between them over a 10-year period. The United States agreed to phase out tariffs on most broadwoven fabrics over 5 years; tariffs on most wool fabrics will be phased out over a 10-year period. U.S. imports of broadwoven fabrics from Jordan totaled just \$43,000 in 1999.

U.S. imports of most textile articles are ineligible for duty-free entry under the Generalized System of Preferences (GSP), the Caribbean Basin Economic Recovery Act (CBERA), and Andean Trade Preference Act (ATPA), except as provided by the Trade and Development Act of 2000 (see below). U.S. imports of broadwoven fabrics under these programs, consisting mostly of silk fabrics, totaled \$21 million in 1999, or 0.6 percent of total U.S. broadwoven fabric imports.

### ***Trade and Development Act of 2000***

In May 2000, the President signed into law the Trade and Development Act of 2000, which provides for expanded trade benefits for 48 eligible countries in sub-Saharan Africa (SSA) under Title I, the African Growth and Opportunity Act, and 24 CBERA beneficiary countries under Title II, the United States-Caribbean Basin Trade Partnership Act. Among the trade benefits in the legislation is preferential treatment for qualifying apparel made in SSA and CBERA beneficiary countries from U.S. fabrics and yarns. The legislation also suspends or reduces U.S. tariffs on imports of worsted wool fabrics and their inputs, and changes the rules of origin for certain textile articles. The key textile and apparel provisions are summarized below.

#### **African Growth and Opportunity Act**

The African Growth and Opportunity Act (AGOA) authorizes unlimited duty-free treatment to imports of apparel made in SSA countries from fabrics produced in the United States of U.S. yarns, eliminates existing U.S. quotas on imports of textiles and apparel from SSA countries, and allows imports of such goods from all SSA countries to enter free of quota during the 8-year period beginning October 1, 2000.<sup>92</sup> The only SSA countries subject to such quotas in 2000 were Kenya and Mauritius; however, there were no quotas on

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<sup>91</sup> The U.S. Congress is expected to begin consideration of implementing legislation for the agreement in the 107th Congress, beginning in 2001.

<sup>92</sup> As noted earlier, the United States will eliminate quotas on textiles and apparel from all WTO countries as of January 1, 2005. Imports of textiles and apparel from non-WTO countries will continue to be subject to control under section 204 of the Agricultural Act of 1956.

broadwoven fabrics. The AGOA also provides for preferential treatment for a specified amount of imports of SSA apparel made from fabrics that are produced in SSA countries of U.S. or SSA yarns (regional fabrics). A special rule also allows apparel entered under this cap from “lesser developed” SSA countries to be made of third-country fabrics (other than U.S. or SSA fabrics) for the first 4 years, through September 30, 2004.<sup>93</sup>

### **United States-Caribbean Basin Trade Partnership Act**

The United States-Caribbean Basin Trade Partnership Act allows imports of qualifying apparel from CBERA beneficiary countries to enter free of duty and quota for 8 years, from October 1, 2000, through September 30, 2008, or if earlier the date on which a Free-Trade Area of the Americas enters into force. The Act authorizes preferential treatment essentially equivalent to that provided under NAFTA for similar goods from Mexico, which competes with CBERA countries for apparel assembly work from U.S. firms; however, full NAFTA parity has not been proclaimed to date. The Act authorizes unlimited preferential treatment to apparel assembled in CBERA countries from fabrics made in the United States of U.S. yarns. Unlimited preferential treatment is also available for textile luggage assembled in these countries from such U.S. fabrics. The U.S. textile industry expects that the trade benefits will encourage a shift in sourcing away from Asian countries to CBERA countries and, in turn, will result in increased U.S. fabric export sales.<sup>94</sup>

### **Rules of Origin**

Section 405 of the Trade and Development Act of 2000 changes the rules of origin for certain dyed and printed fabrics and “flat goods” (e.g., bed sheets and scarves). Under the rules of origin that were implemented on July 1, 1996, as required by section 334 of the Uruguay Round Agreements Act, the country of origin for fabrics and flat goods is the country in which the base fabric was made, regardless of any further finishing operations performed in other countries. For non-wool fabrics and flat goods made from non-wool and non-cotton fabrics (containing less than 16 percent by weight of cotton), the legislation restores the rules of origin in effect before July 1996, which permitted the processes of dyeing and printing to confer origin, when accompanied by two or more finishing operations.

The Clinton administration requested the rules change to implement the terms of an August 1999 agreement with the EU settling a dispute over the section 334 rules. In May 1997, the EU had filed a request with the WTO for consultations with the United States, claiming that the rules adversely affected its exports of dyed and printed fabrics and flat goods to the U.S. market. The EU stated that as a result of the U.S. rules change, its exports of these articles had lost their quota-free access to the U.S. market, and EU exporters had to comply with any

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<sup>93</sup> The AGOA defines a lesser developed SSA country as one that had a per capita gross national product of less than \$1,500 in 1998, as measured by the World Bank. All but six SSA countries (Botswana, Gabon, Mauritius, Namibia, Seychelles, and South Africa) meet the definition of a lesser developed country.

<sup>94</sup> For example, see ATMI presentation, “American Mill’s Prospects in the CBI,” found at Internet site <http://www.atmi.org/newsroom/bestbets.asp>, retrieved Oct. 31, 2000.



U.S. quota or visa requirements applicable to the country of origin of the base fabric. In addition, EU silk accessories such as scarves had to be marked as a product of the country in which the base fabric was formed (mainly China), rather than as a product of the EU country in which the fabric was printed, dyed, and otherwise finished (e.g., Italy or France), as was the usual case under the previous rules. On June 25, 1999, the President signed the Miscellaneous Trade and Technical Corrections Act of 1999 (PL-106-36), which exempts silk woven fabrics and scarves from country-of-origin marking requirements under section 304 of the Tariff Act of 1930.<sup>95</sup>

## **Worsted Wool Fabrics**

Title V of the Trade and Development Act of 2000 reduced U.S. tariffs on worsted wool fabrics suitable for use in making men's and boys' tailored clothing for 3 years beginning on January 1, 2001. The tariff changes are intended to improve the competitiveness of the U.S. tailored clothing industry relative to its counterpart in Canada, whose lower fabric duties have enabled the industry there to greatly expand its exports of men's suits to the U.S. market under NAFTA.<sup>96</sup> Since implementation of the United States-Canada Free-Trade Agreement in 1989, which was suspended in 1994 and its duty phaseout schedules incorporated into NAFTA, U.S. imports of men's and boys' wool suits from Canada have grown sixfold, to 1.3 million suits valued at \$157 million in 1999.

Title V created two tariff-rate quotas (TRQs) for the purpose of granting duty reductions on worsted wool fabrics certified by the importer as suitable for use in making men's or boys' suits, suit-type jackets, and trousers.<sup>97</sup> One TRQ permits 2.5 million square meters equivalent (SMEs) of fabrics having average fiber diameters greater than 18.5 microns to enter each year at 19.3 percent ad valorem, the same rate as that for men's and boys' suit-type jackets made of worsted wool fabrics.<sup>98</sup> The other TRQ allows 1.5 million SMEs of fabrics having average fiber diameters of 18.5 microns or less (the lower the number, the finer the fabric) to enter each year at 6 percent ad valorem, the same as Canada's rate on the finer fabrics.<sup>99</sup> Imports in excess of the TRQ limits are subject to the normal trade relations

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<sup>95</sup> Also in response to EU concerns about the section 334 rules, statistical provisions were created in the HTS in 1999 for "discharge printed fabrics" in order to facilitate the exemption of the fabrics from visa and quota requirements applicable to selected countries in which the base fabric was made.

<sup>96</sup> NAFTA contains a tariff preference level that permits specified amounts of wool apparel from Canada to enter the United States free of duty even though the garments do not meet the NAFTA rules of origin (e.g., the suits are made of European fabric). See additional U.S. note 3 to section XI of the HTS.

<sup>97</sup> In 1999, the fabrics were classifiable in HTS subheadings 5112.11.20 and 5112.19.90.

<sup>98</sup> The 19.3-percent ad valorem rate will be subject to the same staged duty reductions as those agreed to by the United States in the Uruguay Round of multilateral trade negotiations for men's and boys' wool suit-type jackets (HTS subheading 6203.31.00). The tariff on these items will be reduced to 18.8 percent in 2001, 18.4 percent in 2002, and 18 percent in 2003 (the last year of the temporary duty reductions for the fabrics).

<sup>99</sup> The President is authorized to reduce the 6-percent ad valorem rate, as necessary, to equalize the rate with that of Canada.

rate (28.3 percent in 2001).<sup>100</sup> Title V also suspended the tariffs for 3 years on certain fine grades of wool yarns, fibers, and tops (having average fiber diameters of 18.5 microns or less) for use in the manufacture of the worsted wool fabrics.<sup>101</sup>

Title V authorizes the President to modify the TRQ limits in response to requests from U.S. producers of men's and boys' worsted wool tailored clothing, subject to a review of U.S. market conditions, but by not more than 1.0 million SMEs in any of the 3 years. Title V also provides, among other things, for a partial refund of duties paid by specified U.S. manufacturers on imports of the wool fabrics, yarns, fibers, and tops (without regard to micron level) in each of the years 2000, 2001, and 2002.

### ***U.S. Trade-Related Investigations***

In January 1997, the House Committee on Ways and Means requested that the U.S. International Trade Commission conduct a factfinding investigation under section 332 of the Tariff Act of 1930 concerning the likely impact of providing quota-free and duty-free entry to textiles and apparel from SSA countries.<sup>102</sup> In its report to the Committee, the Commission estimated that duty-free and quota-free entry for imports of textiles from SSA countries would result in a negligible effect on U.S. textile shipments.

In February 1999, the Commission determined that the revocation of the antidumping order issued in 1983 on U.S. imports of greige<sup>103</sup> polyester/cotton printcloth from China would be likely to lead to continuance or recurrence of material injury to the domestic industry in the foreseeable time.<sup>104</sup> The investigation was initiated as part of the "sunset" reviews required by the Uruguay Round Agreements Act which requires the U.S. Department of Commerce and the Commission to conduct independent reviews, no later than 5 years after an antidumping or countervailing duty order is issued, to determine whether revoking the order would be likely to lead to continuation or recurrence of dumping or subsidies (Commerce) and of material injury (Commission) within a reasonably foreseeable time. Commerce continued the antidumping order on the printcloth from China for another 5 years, effective as of April 26, 1999.<sup>105</sup>

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<sup>100</sup> The duty reductions temporarily eliminate the "tariff inversion" that exists for the fabrics, where the tariff is higher on the fabric than on the finished garment made of such fabric.

<sup>101</sup> The duty suspension applies to wool yarns under HTS subheading 5107.10.00 (normal trade relations rate of 6.9 percent ad valorem in 2001) and to wool fibers and tops under headings 5101.11 - 5101.30, 5103.10, 5103.20, 5104.00, 5105.21, and 5105.29. Wool tops are used in the manufacture of worsted yarn and are a loose, untwisted rope of fibers that have been combed to straighten the fibers and remove the short fibers.

<sup>102</sup> U.S. International Trade Commission, *Likely Impact of Providing Quota-Free and Duty-Free Entry to Textiles and Apparel from Sub-Saharan Africa* (investigation No. 332-379), USITC publication 3056, Sept. 1997.

<sup>103</sup> The term "greige" means "grey" or unfinished fabric.

<sup>104</sup> U.S. International Trade Commission, *Greige Polyester/Cotton Printcloth from China*, Investigation No. 731-TA-101 (Review), Apr. 1999.

<sup>105</sup> 64 F.R. 424661.

# U.S. Exports

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## Principal Markets and Export Levels

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U.S. broadwoven fabric exports increased at an average annual rate of 7.5 percent during 1994-99 to \$2.6 billion and accounted for 13 percent of domestic shipments in 1999, up from 9 percent in 1994. Mexico and Canada are the largest U.S. export markets for these fabrics, largely resulting from NAFTA trade benefits. U.S. fabric exports to Mexico are believed to be used mostly in the production of apparel for export to the United States. U.S. fabric exports to Mexico grew by roughly 100 percent in 1999, or more than \$620 million over the 1998 level. The substantial increase is believed to be a result of new apparel production in Mexico for the U.S. and Latin American markets, as well as displacement of some U.S. exports to Mexico of cut apparel pieces, which are classified as unfinished or unassembled apparel for export purposes. U.S. exports of woven apparel to Mexico, which are believed to consist mostly of cut apparel pieces, declined by 13 percent, or by \$174 million in 1999.

U.S. broadwoven fabric exports to CBERA countries, which are also used mostly in the production of apparel for export to the United States, increased at an annual average rate of 12 percent during 1994-98, before declining by 32 percent in 1999, to \$189 million. U.S. exports of broadwoven fabrics to most other regions of the world declined during 1994-99.

Export expansion is a key element of the U.S. broadwoven fabric industry's business strategies to adjust to a shrinking domestic customer base, especially for apparel fabrics.<sup>106</sup> The industry is looking in particular to establish a strong market presence in Mexican and CBERA countries, for which they feel they have a competitive advantage. Proximity to these countries, along with trade preferences under NAFTA and new trade legislation for CBERA countries, is seen as bolstering U.S. fabric exports to those countries.

### *Foreign Trade Measures*

Detailed information is not readily available on all foreign trade barriers for U.S. broadwoven fabrics. For the major U.S. export markets, Mexico and Canada, most products enter free of duty under NAFTA and are not subject to quantitative restrictions.<sup>107</sup> In general, EU tariff rates on most wool and manmade fiber fabrics are lower than U.S. rates

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<sup>106</sup> Information in paragraph is from Carlos Moore, executive vice president, ATMI, interview by USITC staff, Nov. 16, 1999.

<sup>107</sup> For Mexico, most imports of broadwoven fabrics from the United States under NAFTA became free of duty as of January 1, 1999; however, the duties on a few fabrics are still being phased out. There are no duties on U.S. exports of qualifying fabrics to Canada under NAFTA.<sup>49</sup>

for comparable products (table 11).<sup>108</sup> EU tariffs for most cotton fabrics are 8.8 percent ad valorem, which is comparable to a 1999 trade-weighted average duty of 9 percent ad valorem for U.S. imports of cotton fabrics.

**Table 11**  
**EU and U.S. tariff rates for imports of selected broadwoven fabrics, 2000**

<i>Percent ad valorem</i>		
Product	EU tariff rate	U.S. tariff rate
Worsted wool fabric typically used in men's suits . . . . .	11.2	29.4
Cotton blue denim fabric . . . . .	8.8	8.6
Manmade-fiber sheeting fabric used in apparel and home textiles . . . . .	9.2	15.7

Source: Harmonized Tariff Schedule of the United States, 2000, and the European Union, Commission Regulation (EC) No. 2204/1999 of 12 October 1999, amending Annex I to Council Regulation (EEC) No. 2658/87 on the tariff and statistical nomenclature and on the Common Customs Tariff, Official Journal, No. L 278 (Oct. 25, 1999).

In general, the ATC required WTO countries to reduce trade barriers on textiles in their home markets. It called on countries to cut and bind their tariffs, reduce or eliminate nontariff barriers, and facilitate customs, administrative, and licensing procedures. In this regard, the United States reached market access agreements with China and India which, as the world's most populous countries, offer the U.S. broadwoven fabric industry opportunities to establish and expand exports.

In November 1999, the United States and India reached an agreement whereby India would lift import bans and import licensing requirements on a large number of products, including textiles. The agreement came after the United States successfully challenged India's restrictions in the WTO.<sup>109</sup> In September 2000, the United States and India reached an agreement that establishes legally binding tariff ceilings on a wide range of textiles and apparel items for imports into India. The agreement fulfills several of India's market opening commitments made under a 1994 agreement, in which the United States and India agreed to reciprocal market access commitments in anticipation of the WTO Agreement on Textiles and Clothing.<sup>110</sup>

In 1997, the United States and China concluded a Memorandum of Understanding (MOU), whereby "the United States obtained significant market opening commitments from China

<sup>108</sup> For EU tariffs for the year 2000, see *Commission Regulation (EC) No. 2204/1999 of 12 October 1999, amending Annex I to Council Regulation (EEC) No. 2658/87 on the tariff and statistical nomenclature and on the Common Customs Tariff, Official Journal, No. L 278 (Oct. 25, 1999).*

<sup>109</sup> Office of the United States Trade Representative, "U.S. and India Reach Landmark Agreement to Lift Longstanding Indian Import Restrictions," press release 00-1, Jan. 10, 2000.

<sup>110</sup> Office of the United States Trade Representative, "United States and India Reach Agreement on Textile Tariff Bindings," press release 00-61, Sept. 15, 2000.

for export of U.S. manufactured apparel and textile products.”<sup>111</sup> In January 1999, China reduced the tariff rates on a large number of textile products, including fabrics. The tariff rates for most cotton fabrics ranged from 18 to 22 percent ad valorem, though a few fabrics had tariffs as low as 12 percent ad valorem. Wool fabrics were subject to a rate of 28 percent ad valorem, and most manmade fiber fabrics had tariff rates ranging from 31 to 34 percent ad valorem.<sup>112</sup> China still maintains a number of nontariff trade barriers (NTBs), which affect all industries, including textiles.<sup>113</sup>

## FOREIGN INDUSTRY PROFILE

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The world broadwoven-fabric industry has been undergoing significant restructuring and modernization as a result of the introduction of advanced weaving technology and keen competition in global markets. Asia is believed to be the world’s largest producer and exporter of broadwoven fabrics, and it accounted for most of the new investments in looms during the 1990s. Other major producers are the EU and the NAFTA countries (United States, Mexico, and Canada). With the ongoing phaseout of textile and apparel quotas under the WTO scheduled to be completed by 2005, producers of broadwoven fabrics in developed and developing countries are likely to undergo further restructuring and upgrading in an effort to ensure their competitive position in markets both at home and abroad.

According to data of the International Textile Manufacturers Federation (ITMF) for 1998,<sup>114</sup> Asia accounted for 30 percent of the shuttleless looms and 95 percent of the shuttle looms<sup>115</sup> for weaving fabrics from yarns spun on the “cotton system,” 96 percent of the filament weaving looms, and 39 percent of the wool weaving looms (table 12).<sup>116</sup> Asia was also the

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<sup>111</sup> U.S. Department of State telegram No. 40894, “Textiles/China: Exchange of Notes,” Washington, DC, Mar. 5, 1997.

<sup>112</sup> U.S. Department of State telegrams No. 321, “China Cuts Tariffs on 1,014 Products,” Jan. 12, 2000, and No. 530, “More on Tariff Cuts,” Jan. 19, 2000, both prepared by U.S. Embassy, Beijing.

<sup>113</sup> For more information on China’s NTBs, see USITC, *Assessment of the Economic Effects on the United States of China’s Accession to the WTO* (investigation No. 332-403), USITC publication 3229, Sept. 1999.

<sup>114</sup> ITMF is a Switzerland-based group whose members include trade associations in many countries representing producers of textile articles and of textile machinery. ITMF conducts textile-related industry surveys, among other things. The Commission compiled individual country data for Asia, which includes Bangladesh, Burma, China, Hong Kong, India, Indonesia, Japan, Korea, Malaysia, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Taiwan, Thailand, and Vietnam.

<sup>115</sup> Shuttleless looms generally are much more efficient than shuttle looms; one industry observer assumed that one shuttleless loom equals three shuttle looms for purposes of estimating broadwoven fabric production capacity. See Robin Anson, Managing Editor, “World Capacities and Shipments of Textile Machinery,” *Textile Outlook International* (Cheshire, United Kingdom: Textiles Intelligence Ltd.), July 2000, p. 94.

<sup>116</sup> The cotton system refers to a process originally used for spinning cotton fiber into yarn, and now also used for making spun yarns of manmade fibers (staple fiber) and blends of cotton and  
(continued...)

**Table 12**  
**Installed weaving capacity in 1998 and loom shipments during 1990-99, by selected regions and countries**

Country/region	Installed capacity, 1998				Shipments, 1990-99	
	Cotton system		Filament weaving looms	Wool weaving looms	Shuttleless looms	Shuttle looms
	Shuttleless looms	Shuttle looms				
World .....	674,690	2,950,540	1,253,830	138,920	489,001	105,398
Asia <sup>1</sup> .....	205,460	2,793,030	1,207,740	54,470	289,822	101,705
China .....	45,800	687,500	196,440	31,050	90,719	48,476
India <sup>2</sup> .....	10,750	1,513,320	701,500	7,600	7,646	16,466
United States <sup>3</sup> .....	58,600	4,630	-	1,440	26,464	41
Mexico .....	14,500	35,000	-	1,150	6,163	51
Canada <sup>3</sup> .....	3,000	-	-	350	887	-
EU-15 .....	58,690	10,230	21,210	33,710	61,984	81
Other .....	334,440	107,650	24,880	-	103,681	3,520

<sup>1</sup> In addition, Bangladesh had 25,000 powerlooms in the non-mill sector and 500,000 handlooms in the handloom sector. Pakistan had 200,000 powerlooms in the non-mill sector and 80,000 handlooms in the handloom sector.

<sup>2</sup> In addition, India has about 3.9 million handlooms in the handloom sector.

<sup>3</sup> Data for the United States and Canada include filament weaving.

Note.—World and Asia data were estimated by the Commission based on ITMF data.

Source: International Textile Manufacturers Federation, International Textile Machinery Shipment Statistics, 1999, and prior issues.

largest buyer of shuttleless looms during 1990-99, accounting for 59 percent of world shipments. The EU accounted for 9 percent of the cotton-system shuttleless looms in place in 1998 and the NAFTA countries 12 percent (NAFTA data also include filament weaving looms). Russia and the former Soviet Republics, along with Eastern Europe, accounted for one-third of the cotton-system shuttleless looms in place.

Asia accounted for about 48 percent of world exports of broadwoven fabrics in 1998, or \$26 billion (table 13). The EU supplied 44 percent, or \$24 billion. The NAFTA countries supplied 6 percent of the world exports, or \$3 billion; the United States alone accounted for almost 5 percent of the world total. The relative importance of Asia in the production and export of broadwoven fabrics largely reflects its low operating costs, particularly labor costs. According to ITMF data on production costs for seven countries,<sup>117</sup> total manufacturing costs for weaving broadwoven fabrics of spun yarn (ring and open-end) was lowest in Indonesia, Brazil, and India and highest in the United States and Italy (figure 6). Most of the overall cost differential stemmed from the labor cost component, which was much higher for the United States and Italy than for the other five countries in the study.<sup>118</sup>

<sup>116</sup> (...continued)

manmade fibers. Filament weaving looms are used for weaving filament yarn (fiber of indefinite length) of manmade fibers or silk.

<sup>117</sup> The seven countries are Brazil, India, Indonesia, Italy, Korea, Turkey, and the United States, all of which are ITMF members that actively participate in international textile trade as exporters and/or importers.

<sup>118</sup> According to data of Virginia-based Werner International, Inc., "Hourly Labor Cost in the (continued...)"

**Table 13**  
**Broadwoven fabrics: World exports by principal sources and selected country-group suppliers, 1994-98**

<i>Million dollars</i>					
<b>Country</b>	<b>1994</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>
Italy .....	6,307	7,299	7,232	7,003	7,135
China .....	5,963	7,024	5,872	6,638	6,201
Korea .....	6,717	7,508	7,256	6,863	5,361
Germany .....	5,377	5,987	5,412	5,051	5,121
Taiwan .....	3,099	3,451	3,607	3,500	3,680
France .....	2,879	3,444	3,369	3,270	3,423
Japan .....	3,881	4,051	4,024	3,879	3,297
United States .....	1,887	2,043	2,232	2,408	2,448
Belgium and Luxembourg .....	1,733	2,013	2,058	2,223	2,302
Pakistan .....	1,617	1,576	1,923	1,877	1,899
United Kingdom .....	1,469	1,642	1,710	1,760	1,697
India .....	1,471	1,582	1,650	1,618	1,511
Spain .....	685	945	1,063	1,154	1,282
Indonesia .....	1,436	1,505	1,504	1,160	1,202
Turkey .....	710	984	947	1,075	1,137
Other .....	9,013	10,428	11,017	10,682	10,272
World total .....	51,500	58,400	57,100	56,150	53,850
Selected country groups:					
NAFTA .....	2,393	2,723	3,007	3,279	3,353
Asia .....	27,300	29,925	29,400	28,550	25,750
EU-15 .....	21,043	24,418	23,779	23,276	23,890

Source: Compiled from unpublished data of the United Nations (U.N.) for Standard International Trade Classification (SITC) subgroups 652, 653, and 654; data for selected countries estimated by the Commission based on unpublished U.N. data for SITC 65 and Harmonized System headings 5007, 5111-5112, 5208-5212, 5309-5311, 5407-5408, 5512-5515, 5801, 5803, and 5809. Data for world total partly estimated by the Commission.

The United States had a comparative cost advantage compared with India in terms of capital and power costs. For the same reasons, the cost of weaving fabric in Korea was less than that for India, even though Korea's labor costs were several times larger than those for India.

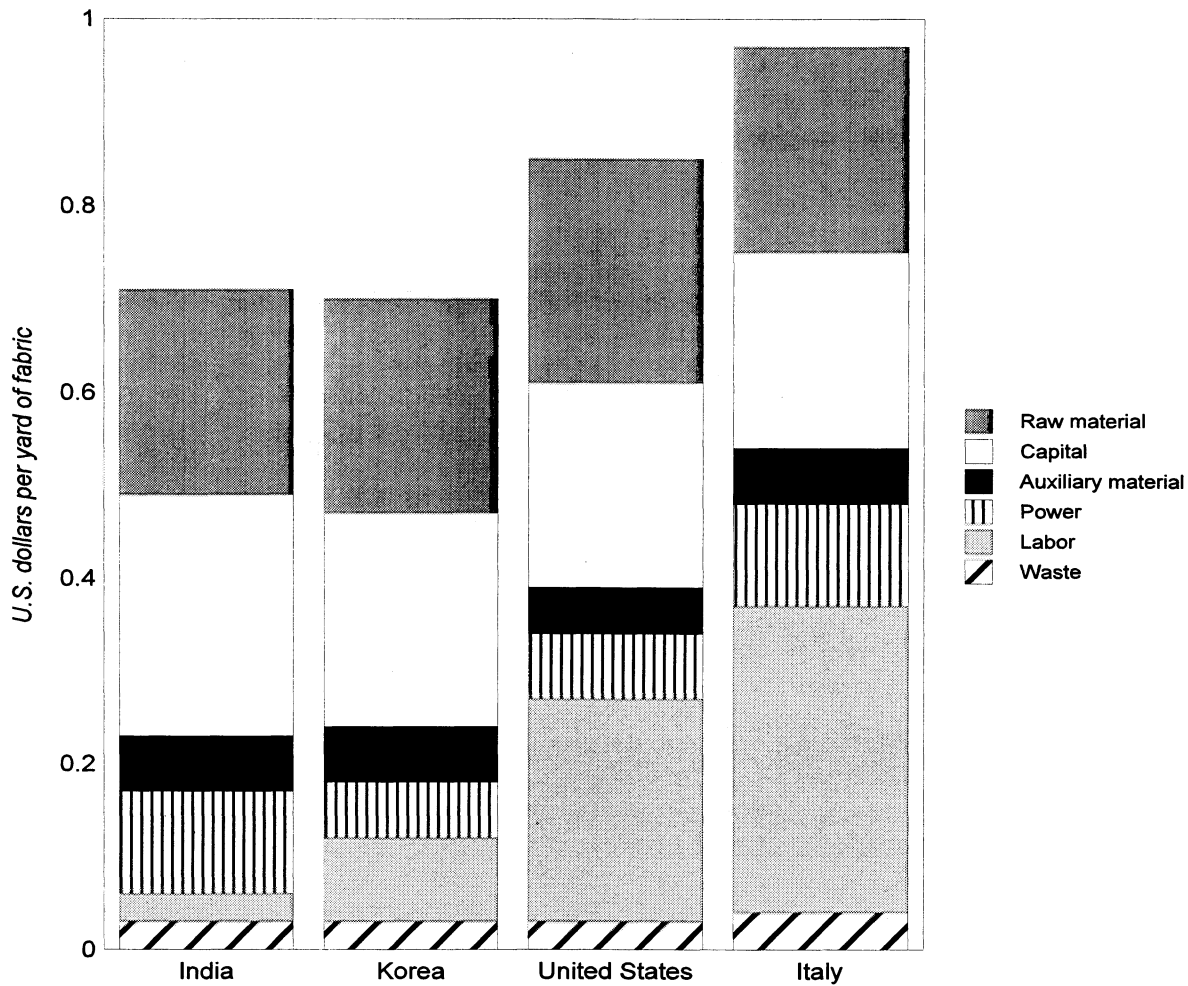
The remainder of this section provides a brief overview of the textile (including fabric) industries in China and India, the largest producers of broadwoven fabrics estimated to account for slightly more than one-half of global production by quantity;<sup>119</sup> the EU, a major producer of value-added fabrics; and Mexico, the only NAFTA country to experience growth in weaving capacity during the past half decade.

<sup>118</sup> (...continued)

Textile Industry," Spring 1998, hourly labor costs (including social benefits and fringes) in the textile industry for 1998 averaged \$0.60 for India, \$0.24 for Indonesia, \$15.81 for Italy, \$3.63 for Korea, and \$12.97 for the United States.

<sup>119</sup> Estimated by the Commission based on data of the United Nations, *Industrial Commodity Statistics Yearbook*, 1996; OECD, *PR China: Textile and Clothing Sector and its Export Potential*, June 1999, p. 70; and the Government of India, Ministry of Textiles, "Annual Report 1999-2000," found at Internet address <http://texmin.nic.in/annualrep/arch03.htm>, retrieved Mar. 8, 2000.

**Figure 6**  
**Broadwoven fabric production costs for selected countries, 1999**



Source: International Textile Manufacturers Federation, International Production Cost Comparison, 1999

## China

China's textile industry has been undergoing extensive restructuring since 1998, when the Government of China began a 3-year plan to improve operations of the state-owned enterprises (SOEs), many of which had been incurring losses since 1993.<sup>120</sup> Under the plan

<sup>120</sup> Information in paragraph is mainly from U.S. Department of State telegram No. 2711, "SOE Reform: China Textile Industry Leads the Way!?" Mar. 24, 2000. For further information on China's textile industry, see USITC, *Assessment of the Economic Effects on the United States of China's Accession to the WTO* (investigation No. 332-403), USITC publication 3229, Sept. 1999, ch. 8. 54



for the SOEs, which dominate the textile industry, unprofitable SOEs were closed or allowed to go bankrupt, or merged with profitable SOEs. The Government established a \$1.5 billion reserve fund in 1998 to help write-off bad debt and reduce the impact of industry losses; it reportedly replenished the fund by an unspecified amount in 1999. The Government also called for the elimination of nearly one-fourth of the spindles in the cotton sector in an effort to reduce yarn spinning capacity and to increase yarn quality.

The restructuring has led to the elimination of nearly 1.2 million jobs in China's textile industry, while its fabric production fell by almost 30 percent in 1999 from the 1998 level. However, in 1999 the textile industry became profitable for the first time in 5 years. The Government of China attributed the profit turnaround to many factors, including lower production costs following the structural reform of the industry; deregulation of domestic cotton prices, which subsequently fell sharply from their 1997 high; and increased international and domestic demand for Chinese textiles and apparel.<sup>121</sup>

The Government of China continues to restructure and modernize the textile industry, reportedly committing \$2.4 billion in grants to its top 200 firms and another \$1.7 billion in loans for the next few years for technological upgrades. The Government has set modernization goals for the entire textile supply chain, including having 50 percent of yarn spinning capacity and 40 percent of fabric production capacity operating at advanced international levels by 2005. The Government also seeks to have shuttleless looms make up at least 25 percent of the total number of looms in place by 2005; they accounted for just 6 percent of the total in 1998. In the dyeing and finishing sector, a weak link in China's textile supply chain, the goal is to have 40 percent of the dyeing equipment meet advanced international levels by 2005.<sup>122</sup> By 2005, China's goal is to have 80 percent of the country's apparel exports made with fabric produced domestically.<sup>123</sup>

China's imports of broadwoven fabrics of \$5.7 billion in 1999 were slightly less than its exports of \$5.8 billion. Its largest import sources are Japan, Taiwan, Korea, and Hong Kong, which together accounted for more than 80 percent of China's broadwoven fabric imports in 1999. Hong Kong is the largest export market, accounting for 34 percent of China's broadwoven fabric exports in 1999, followed by Korea, Bangladesh, and Japan, together accounting for another 18 percent. The United States is the fifth-largest export market with about 3 percent of the total.<sup>124</sup>

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<sup>121</sup> Ibid.

<sup>122</sup> See, for example, "China, Hit By Crisis," *Textile Asia* (Hong Kong: Business Press Ltd.), Aug. 1999, p. 83.

<sup>123</sup> Unless otherwise noted, information in paragraph is from U.S. Department of State telegrams No. 2711, "SOE Reform: China Textile Industry Leads the Way!?" and No. 2716, "China/Textiles: WTO's Challenges and Opportunities," both dated Mar. 24, 2000.

<sup>124</sup> Based on data from Source World Trade Atlas® - Canada Edition, a product of Statistics Canada and Global Trade Information Services, Inc. Copyright 1993, 2000, Global Trade Information Services, Inc.

# India

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India is the world's second-largest producer of broadwoven fabrics after China, but only the 12th largest exporter by value in 1998. India's textile industry consists of the organized mill sector and the "decentralized" powerloom and handloom sectors.<sup>125</sup> The organized mill sector comprises medium- to large-sized units that are either vertically integrated "composite mills" that perform spinning, weaving, and finishing operations or mills that specialize in certain of these operations. The organized mill sector accounted for about 5 percent of India's fabric production by quantity, but 30 percent of its exports of machine-made cotton fabrics.<sup>126</sup> Capacity utilization in the organized mill sector is low, averaging only 51 percent in fiscal year 1998 (the 12-month period beginning on April 1, 1998).<sup>127</sup>

The decentralized sectors generate 95 percent of India's fabric production by quantity, with the powerloom sector accounting for 73 percent of the total and the handloom sector 22 percent. These sectors comprise thousands of small fabric-weaving and processing (dyeing and finishing) units, with a typical powerloom sector unit having 12 to 44 power-driven shuttle looms and a handloom sector unit having 2 to 6 manually operated looms.<sup>128</sup> Although the decentralized sectors use technology that lags considerably behind that of the organized mill sector, some powerloom weavers have invested in shuttleless looms.<sup>129</sup> The decentralized sectors, unlike the organized mill sector, benefit from favorable government policies, such as exemptions from various taxes and labor regulations.<sup>130</sup>

India's weaving capacity is huge in terms of the number of looms in place, but most of them are outdated. High capital costs have discouraged new investment in the textile industry. During the last 10 years, India received less than 2 percent of world shipments of new shuttleless looms (see table 12). To upgrade the technological base in the textile industry, the Government of India has established a special fund to give it access to capital at internationally comparable interest rates.<sup>131</sup> Indian textile firms are investing in new technology and entering into joint ventures with foreign firms to obtain technical and marketing assistance and expand and upgrade manufacturing operations and product quality.

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<sup>125</sup> For detailed information on India's textile industry, see USITC, *India's Textile and Apparel Industry: Growth Potential and Trade and Investment Opportunities*, Staff Research Study No. 27, USITC publication 3401, Mar. 2001.

<sup>126</sup> Based on data of the Government of India, Ministry of Textiles, "Annual Report 1999-2000," found at Internet address [http://texmin.nic.in/annualrep/ar00\\_con.htm](http://texmin.nic.in/annualrep/ar00_con.htm), and The Cotton Textiles Export Promotion Council, *Monthly Statistics*, found at <http://www.texprocil.com/texprocil/monthly/t-2.htm#t2>, both retrieved Oct. 3, 2000.

<sup>127</sup> Government of India, Ministry of Textiles, "Annual Report 1999-2000."

<sup>128</sup> Prodipto Roy, "Competitiveness of the Indian Textile Supply Chain," *Textile Outlook International* (United Kingdom: Textiles Intelligence Ltd.), Sept. 1999, p. 116.

<sup>129</sup> Government of India, Ministry of Textiles, "Annual Report 1999-2000."

<sup>130</sup> Textile industry and trade association officials in Mumbai, Coimbatore, and New Delhi, India, interviews by USITC staff, Jan. 31-Feb. 11, 2000.

<sup>131</sup> Government of India, Ministry of Textiles, "Annual Report 1999-2000."

## European Union

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EU production of broadwoven fabrics fell by 11 percent during 1994-99 to \$19 billion, which is roughly equivalent to estimated U.S. shipments of broadwoven fabrics in 1999.<sup>132</sup> Much of the decline occurred in apparel fabrics, largely reflecting the growth in EU imports of finished apparel products. The share of the EU broadwoven-fabric market accounted for by imports rose from 27 percent in 1994 to 39 percent in 1999. Import market shares also rose from 34 to 46 percent for apparel and from 15 to 26 percent for home textiles during the period. As imports of finished goods mainly from low-cost countries rose, prices of these goods fell, putting further pressure on the EU broadwoven fabric industry. To maintain its competitive position in the home market, the EU industry is focusing on developing innovative fabrics, and brand and product design, and forming strategic alliances with suppliers and customers.

Despite the growth in EU imports of broadwoven fabrics during the 1990s, the EU maintains a favorable balance of trade in these goods. In 1999, EU exports to non-EU countries of nearly \$11 billion were more than double imports. In 1997, the latest year for which detailed data are readily available, the United States was the fifth-largest market for EU woven fabric exports, after Tunisia, Poland, Morocco, and Romania, major outward processing sites for EU textile firms.<sup>133</sup> In general, EU exports of broadwoven fabrics to non-EU countries compete less on price than on the kind of product, the quality, and the reliability of the exporter.<sup>134</sup>

## Mexico

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The Mexican textile industry has grown significantly since the implementation of NAFTA in 1994, in large part to serve a rapidly growing apparel industry in Mexico. Industry employment rose by 32 percent during 1995-98 to 175,730 workers.<sup>135</sup> The industry consists mostly of relatively small firms, with more than 85 percent of the roughly 2,900 establishments having less than 100 employees each in 1999. The national wage rate for textile workers in Mexico in 1998 averaged \$2.23 per hour, compared with an average of \$12.97 for U.S. textile workers.<sup>136</sup>

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<sup>132</sup> Information on the EU textile and apparel industries is from Eurostat, *Panorama of European Business, 1999*, pp. 145-146, and L'Observatoire Européen du Textile et de L'Habillement (OETH), Brussels, *The EU Textile and Clothing Sector 2000*, May 2000, table 15, and *The EU Textile and Clothing Sector 1999*, Apr. 1999, table 1. Data in euros converted at an exchange rate of \$1.066 per euro in 1999. See European Central Bank, *Monthly Bulletin*, June 2000, table 10, found at internet address <http://www.ecb.int/pub/pdf/mb200007en.pdf>, retrieved Sept. 19, 2000.

<sup>133</sup> Calculated by the Commission based on data in OETH, *Benchmarking EU Export Performance in Textiles and Clothing*, Feb. 2000, p. 178.

<sup>134</sup> OETH, *Benchmarking EU Export Performance in Textiles and Clothing*, Feb. 2000, p. 87.

<sup>135</sup> Data from Cámara Nacional de la Industria Textil (CANAINTEX), found at Internet address <http://www.canintex.org.mx//informac/textiles/textil4.html>, retrieved Sept. 27, 2000.

<sup>136</sup> Data on hourly labor costs, including fringe benefits, from Werner International, Inc., "Hourly Labor Cost in the Textile Industry," Spring 1998.

The United States is Mexico's largest trading partner in broadwoven fabrics, accounting for roughly three-fourths of both its imports of \$1.4 billion and its exports of \$510 million in 1999.<sup>137</sup> Several U.S. broadwoven fabric producers have either established or are in the process of investing in apparel fabric operations in Mexico in order to be closer to the apparel markets that they supply. U.S. mills are also expected to use Mexico as a platform upon which to export goods to countries and regions with which Mexico has free trade agreements. Besides the NAFTA countries, Mexico has free-trade agreements with a *number of Latin American countries*, signed a free-trade agreement with the EU in March 2000, and has entered into free-trade negotiations with the European Free-Trade Association (Norway, Switzerland, Iceland, and Liechtenstein).<sup>138</sup>

Among the U.S. firms that have invested, or announced plans to invest, in broadwoven fabric production in Mexico include Burlington Industries (denim and worsted wool fabrics), Cone Mills (denim), Galey and Lord (denim), and Dan River, Inc. (apparel fabrics).<sup>139</sup> Several U.S. firms have invested in upstream and downstream production facilities, thereby effectively vertically integrating their production in Mexico. For example, Burlington Industries has a joint venture with Parkdale Mills to make ring-spun cotton yarn and a jeans sewing facility in Mexico.<sup>140</sup> Some Asian firms reportedly are also establishing or planning textile operations in Mexico. According to a trade source, Worldbest, a state-owned textile firm in China, recently announced that it is investing in a \$96 million plant in Mexico to make cotton fabrics for the North American market.<sup>141</sup> Two Taiwan firms have reportedly invested in vertical textile and apparel operations in Mexico, with one firm having spinning, weaving, cutting, and sewing operations for the production of denim apparel, while the other firm announced plans to set up operations to produce polyester staple fiber, yarn, fabric, and apparel.<sup>142</sup>

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<sup>137</sup> Based on data from Source World Trade Atlas® - Canada Edition, a product of Statistics Canada and Global Trade Information Services, Inc. Copyright 1993, 2000, Global Trade Information Services, Inc.

<sup>138</sup> U.S. Department of State, *FY 2001 Country Commercial Guide: Mexico*, p. 8.

<sup>139</sup> "Mexico Weaves More Ties with the U.S.," *Wall Street Journal*, Aug. 21, 2000, p. 7.

<sup>140</sup> For more information on U.S. investment in Mexico, see USITC, *Production Sharing: Use of U.S. Components and Materials in Foreign Assembly Operations, 1995-1998* (investigation No. 332-237), USITC publication 3265, Dec. 1998, pp. 3-22 through 3-27.

<sup>141</sup> "News Briefs," *Pacific Trade Winds* (Santa Barbara, CA: Pacific Trade Winds Co.), Jan. 2000, p. 3.

<sup>142</sup> "Taiwan Textile Industry," China External Trade Development Council, 1998, found at Internet address <http://www.tptaiwan.org.tw/tto/exitem/textex.htm>, retrieved Oct. 2, 2000. 58

**APPENDIX A**  
**RECENT RESTRUCTURING AND**  
**MODERNIZATION IN THE U.S.**  
**BROADWOVEN FABRIC INDUSTRY**

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(Information in this appendix was compiled by the Commission as of July 2000.)

**APPENDIX A  
RECENT RESTRUCTURING AND MODERNIZATION IN THE U.S. BROADWOVEN FABRIC  
INDUSTRY**

Firm and products	Foreign activity	Recent restructuring and modernization
<p><b>Avondale Inc. Monroe, GA</b></p> <p>Vertically integrated producer of finished woven apparel fabrics (70 to 75 percent of net sales), including indigo-dyed denim and other fabrics, especially for jeans, sportswear, outerwear, and uniforms. Also makes and sells yarns (7 percent of sales) for apparel and home furnishing fabrics, though in-house weaving consumes most yarn output; grey fabrics for apparel, home furnishings, and industrial uses; and specialty fabrics, such as coated materials for awnings, tents, boat covers, and life vests.</p>	<p>No information available.</p>	<p>Restructured and modernized over the past 5 years to improve productivity, reduce unit costs, lead times and inventory levels, and maximize flexibility in responding to customer needs. Acquired Graniteville Co., an integrated producer of woven fabrics for uniforms and other garments; built a state-of-the-art integrated denim weaving mill; in other plants, expanded or modernized operations for producing yarn and weaving, finishing and inspecting fabric; installed systems for reclaiming waste fibers and recovering chemicals used in processing; and, commensurate with consuming more of its yarn and grey fabric output to improve capacity utilization, consolidated facilities and closed a yarn plant.</p>
<p><b>Burlington Industries, Inc. Greensboro, NC</b></p> <p>Vertically integrated producer of finished or grey woven fabrics for apparel (about 50 percent of net sales), including outerwear, uniforms, and athletic and protective garments, and for home furnishings (45 percent of sales), including mattresses, draperies, and upholstered furniture. Also makes and sells such end-use products as draperies, table linens, tufted carpets and rugs, and customer-specified garments.</p>	<p>In Mexico, operates five plants producing carpet and woven fabrics for apparel and home furnishings and two plants assembling garments. Also has joint venture plants abroad: one for yarn production and another for garment processing in Mexico; and one for denim fabric production in India. Markets products in Canada and countries of Latin America, Europe, and Asia. Exports, of which about half go to Canada and Mexico, provide about 15 percent of revenues.</p>	<p>Focused recent capital spending and systems improvements on raising productivity and quality, lowering costs, and implementing production techniques and electronic linkages with customers and suppliers to reduce lead times and improve service. Acquired majority interest in a firm developing novel chemistry for fabric applications. Currently restructuring to modernize, focus on value-added products, and reduce U.S. apparel fabric production capacity by 25 percent: consolidated the various apparel fabric business units into two; disposed of a yarn division; and is closing or selling several plants producing fabrics.</p>

**APPENDIX A  
RECENT RESTRUCTURING AND MODERNIZATION IN THE U.S. BROADWOVEN FABRIC  
INDUSTRY—Continued**

Firm and products	Foreign activity	Recent restructuring and modernization
<p><b>Cone Mills Corp. Greensboro, NC</b></p> <p>Vertically integrated producer of woven fabrics, primarily finished denim and khaki (about 70 percent of net sales) for apparel and jacquard fabrics for home furnishings. Also dyes and prints apparel and home furnishing fabrics on commission (15 percent of sales) and functions as a converter in designing and distributing woven fabrics for upholstery, draperies, and bedspreads.</p>	<p>Has a joint-venture plant in Mexico producing yarn and denim marketed and distributed by Cone. Has announced plans to expand production in Mexico with a denim mill and with joint ventures to develop and operate a textile and apparel industrial park and a yarn mill. Has a sales office in Brussels and sales agents in Japan, Hong Kong, and countries of Africa, Europe, and Central and South America. Exports represent about 25 percent of sales overall and 37 percent for denim fabric.</p>	<p>Focused recent capital projects in such areas as replacing all looms for weaving denim to maintain modern, flexible production facilities; modernizing rotary screen printing plants to ensure customer service and product quality; and expanding capacity in jacquard fabric production. Sold several non-core businesses. To lower costs and improve efficiency and market responsiveness, has launched a comprehensive downsizing and reorganization program, with such facets as merging the denim and sportswear fabric businesses; ceasing production of ring-spun yarn and of yarn-dyed and chamois flannel shirting fabrics; and reducing and reorganizing staffs in manufacturing, sales, and administration.</p>
<p><b>Culp, Inc. High Point, NC</b></p> <p>Vertically integrated producer of finished woven and tufted upholstery fabrics (about 78 percent of net sales), including printed and flock-coated fabrics, for residential and commercial furniture and other upholstered products, such as baby car seats. Also produces finished ticking fabric used in mattresses.</p>	<p>Has a plant in Canada producing mattress ticking. Foreign markets accounted for 23 percent of net sales in 1999 and 29 percent in 1998, accomplished through international sales agents. Non-U.S. sales predominate in North America, the Middle East, Europe, the Far East, and elsewhere in Asia.</p>	<p>During the past 5 years, increased capacity for weaving jacquard, dobby, and velvet fabrics by acquiring Rossville/Chromatex, Rayonese, and Phillips Mills, and improved control of yarn supply and design by acquiring Artee Industries. Enhanced fabric design capability with a new design center; improved efficiency, customer service, and effectiveness of design resources by reorganizing from six business units to four divisions; augmented efficiency, capacity, and product scope through capital investments in production facilities and machinery; and achieved ISO-9002 certification in 6 of its 17 plants.</p>

**APPENDIX A  
RECENT RESTRUCTURING AND MODERNIZATION IN THE U.S. BROADWOVEN FABRIC  
INDUSTRY—Continued**

Firm and products	Foreign activity	Recent restructuring and modernization
<p><b>Dan River Inc. Danville, VA</b></p> <p>Vertically integrated producer of finished or grey woven fabrics (about 25 percent of net sales) for apparel, upholstery applications, decorating, crafts, and home sewing and of home textiles (70 percent of sales), such as sheets, comforters, decorative pillows, and draperies. Also manufactures customer-specified yarns and woven fabrics for high-pressure hoses, conveyor belts, and other industrial products.</p>	<p>During 2000, made agreements with Grupo Industrial Zaga, S.A. de C.V. to build and operate two jointly owned plants in Mexico expected to be fully operational during 2000-01, one for apparel fabric production and the other for apparel production. Has agreed to purchase Import Specialists, Inc., an importer of home fashion products primarily from China and India. Exports represent less than 6 percent of apparel fabric sales and less than 3 percent of home textile product sales.</p>	<p>Restructured and modernized during the past 5 years to increase capacity, efficiency, and capacity utilization; reduce costs and dependence on outside manufacturers; improve service, communication with customers, and coordination of production schedules with orders; and meet customers' quick response delivery requirements. Acquired The New Cherokee Corp., a producer of shirting and sportswear fabrics. Merged with The Bibb Co., a supplier of home fashion products. Has agreed to purchase Wes Tek Inc., a producer of yarns and fabrics for industrial applications. Achieved ISO-9001 certification in engineered product facilities.</p>
<p><b>Delta Woodside Industries, Inc. Greenville, NC</b></p> <p>Vertically integrated producer of finished woven fabrics primarily used in pants, blazers, and uniforms, including civilian career wear and battle dress camouflage military uniforms.</p>	<p>Sells and distributes fabric in Canada and Mexico, along with the United States, through a marketing office in New York City. Also has sales agents operating in Mexico.</p>	<p>Since 1997, restructured to discontinue or reduce unprofitable or non-core businesses and operations. Exited the knit fabric business by liquidating Stevcoknit Fabrics Co. and the fitness equipment business by selling Nautilus International; and is spinning off the Delta Apparel and the Duck Head Apparel divisions. Discontinued sales of grey woven fabrics to sell only the more profitable finished fabrics; and downsized production of synthetic-fiber fabrics.</p>



**APPENDIX A  
RECENT RESTRUCTURING AND MODERNIZATION IN THE U.S. BROADWOVEN FABRIC  
INDUSTRY—Continued**

Firm and products	Foreign activity	Recent restructuring and modernization
<p><b>Galey &amp; Lord, Inc.</b> <b>New York, NY</b></p> <p>Vertically integrated producer of finished apparel fabrics (about 90 percent of net sales), such as denim, corduroy, flannel, and sueded materials used in pants, shorts, uniforms and other garments, and of finished or grey home furnishing fabrics (3 percent of sales) used in bedspreads, comforters, curtains and upholstery applications. Also cuts, sews, and finishes garments.</p>	<p>Operates one apparel fabric plant each in Canada and Italy, seven apparel factories in Mexico, and sales offices in Asia, Europe, and South America. Has joint venture apparel fabric plants in Tunisia and the Philippines and has contracted for one in Mexico. Its Swift Europe business is a leading denim supplier to Europe, Asia, and North Africa; its Klopman International business is the leading pan-European fabric supplier for work and career apparel. Overall, non-U.S. sales represent 20 to 25 percent of net sales.</p>	<p>During 1994-99, acquired Burlington Industries' decorative prints division, enabling entry into home furnishing fabric production; Dimmit Industries and another apparel factory, enabling the offering of finished fabric and garment packages; and Dominion Textiles' apparel fabric business, expanding international operations and improving service to customers operating abroad. Closed the printed apparel fabric business; reduced garment style selection to lower production inefficiencies due to frequent style changes; and modernized to reduce costs and improve flexibility in producing a wide range of fabrics.</p>
<p><b>Johnston Industries, Inc.</b> <b>Columbus, GA</b></p> <p>Vertically integrated producer of finished or grey woven or nonwoven fabrics, such as denim and other apparel fabrics, upholstery face and backing fabrics, mattress ticking and filler cloth, hosing, and coated filtration fabric. Also makes and sells multi-axial and composite reinforced fabrics used in reinforced products and structures, such as skis, baseball bats, roof panels, oil well platforms, sea walls, and utility poles; and yarns, fiber batts, wiper cloths, towels, and sheets made from reprocessed waste fibers and off-quality fabrics. Home furnishing products account for 51 percent of sales; automotive and industrial products, 27 percent; and yarn, recycled fibers, and composite reinforced fabrics, 17 percent.</p>	<p>Employs a sales force to market outside the United States, mainly in Europe, Canada, and Mexico. Towels and sheets made from reprocessed waste fiber and off-quality fabric are sold mainly in Africa. In 1999, foreign direct sales represented about 6 percent of total sales. Also, customers often resell fabrics in foreign markets, either in original form or as product components; for example, eastern Europe has been an important market for resold upholstery substrate fabric bought from Johnston.</p>	<p>Modernized in the last few years by investing in state-of-the-art, vertically integrated, flexible, low-cost manufacturing capabilities. In 1997, began major restructuring with such components as reduction of centralized management and re-assignment of operational and sales management to the separate business units; cost reduction by consolidating or selling unprofitable non-core operations and redesigning products to simplify production processes; improvement of information management with an integrated system for procurement, inventory, marketing management, and customer orders; and improvement of product line management for greater profitability by exiting product lines and other means. In 2000, made an agreement for Covington Industries, a home textiles fabric converter and manufacturer, to merchandise Johnston's upholstery fabrics. Is in the process of being acquired by an investment firm.</p>

**APPENDIX A  
RECENT RESTRUCTURING AND MODERNIZATION IN THE U.S. BROADWOVEN FABRIC  
INDUSTRY—Continued**

Firm and products	Foreign activity	Recent restructuring and modernization
<p><b>JPS Industries, Inc. Greenville, SC</b></p> <p>Vertically integrated producer of grey woven fabrics (50 to 55 percent of net sales), for use in blouses, dresses and sportswear, and of fiber-glass and other specialty-fiber woven fabrics finished to customer specifications (24 percent of sales), for use in circuit boards, filtration bags, cargo liners and other industrial applications. Also extrudes films and sheets from resins, for use in roofing, reservoir liners, landfill caps and other industrial and consumer products (24 percent of sales).</p>	<p>Has a sales office in the United Kingdom and an extensive distribution network in Europe. Licenses roofing technology to Protan A/S of Norway for manufacturing and marketing roofing products in Scandinavia. Licenses roofing and geomembrane compound and manufacturing technologies to Tsutsunaka Plastics Industries of Japan for producing membranes in Japan.</p>	<p>To reflect repositioning to a diversified industrial and specialty products firm, adopted the present name in 1999 in place of JPS Textile Group. Focused recent capital projects largely on increasing capacity and productivity and reducing costs in industrial product segments. Since 1993, sold several business units, such as ones producing home fashion woven fabrics, manmade-fiber industrial fabrics, automotive and cotton commercial products, and carpet; and established a technical services center to develop new industrial products and manufacturing processes.</p>
<p><b>Quaker Fabric Corp. Fall River, MA</b></p> <p>Vertically integrated producer of woven finished upholstery fabrics (about 90 percent of net sales). Also produces and sells chenille and other specialty yarns used in apparel and home furnishing fabrics, though in-house weaving consumes a high proportion of specialty-yarn output.</p>	<p>Reflecting the strategy of global distribution, has developed fabrics for international markets, simplified customers' purchasing, and continues to build a sales and distribution network focused on Mexico and other Latin American countries, Australia, New Zealand, and parts of Europe, the Far East, and the Middle East. Has a distribution center in Mexico and plans to set up a subsidiary in Brazil to market and distribute fabrics. In 1998, exports accounted for slightly more than 18 percent of gross sales.</p>	<p>Over the past 5 years, invested in manufacturing equipment to expand capacity, improve efficiency, and support product quality (e.g., defect-free), marketing, and distribution objectives. Put about 300 new looms into fabric production during the 1990s. Introduced bar coding in all manufacturing areas to electronically track materials from receiving to shipping. Achieved ISO-9001 certification in all operations. Recently announced implementation of a new supply chain management system to reduce lead times and inventories and enhance customer service by improving on-time delivery performance.</p>

**APPENDIX A  
RECENT RESTRUCTURING AND MODERNIZATION IN THE U.S. BROADWOVEN FABRIC  
INDUSTRY—Continued**

Firm and products	Foreign activity	Recent restructuring and modernization
<p><b>Springs Industries, Inc. Fort Mill, SC</b></p> <p>Vertically integrated producer of finished or grey woven or nonwoven specialty fabrics (8 percent of revenues in 1997-98) for apparel, home textiles, and industrial products through 1998. Also produces, purchases for resale, and markets a range of textile and nontextile home furnishing products (100 percent of revenues in 1999 and 92 percent in 1997-98), including home-sewing fabrics, bed linens, comforters, infant apparel, and many other products.</p>	<p>Foreign sales accounted for nearly 7 percent of total sales in each of the last 3 years, with sales in Canada comprising the bulk. A subsidiary, Springs Canada, markets and distributes to Canadian retailers bath and bedding products purchased primarily from a Canadian manufacturer.</p>	<p>In 1996, adopted a plan to focus on offering a wide array of home furnishing products. As a result, increased purchasing, and scaled back production, of grey fabrics; divested several plants and business units producing fabrics for apparel, furniture, and industrial products; and exited the apparel fabric and industrial product businesses. Also, acquired two firms that supply home textiles; consolidated and replaced information systems to improve internal operations and customer service; and partnered with several other textile companies in an e-commerce marketplace for buying and selling products throughout the fiber-to-finished goods supply chain.</p>
<p><b>Thomaston Mills, Inc. Thomaston, GA</b></p> <p>Vertically integrated producer of finished woven home furnishing fabrics and products made from them (65 percent of net sales), such as bed linens and comforters. Also dyes and finishes, on commission, grey woven fabrics (35 percent of sales) used in casual and career apparel.</p>	<p>Handles foreign sales, which account for 4 to 5 percent of net sales, through the corporate office and commissioned sales agents and distributors in Canada, Europe, the Middle East, and Central and South America. In 2000, launched a joint venture with an Austrian producer of home textiles.</p>	<p>Restructured and modernized during the past 5 years to expand capacity in home textiles production, lower costs, inventory levels and lead times, and improve productivity and on-time product deliveries to customers. Also downsized and discontinued the denim and sales-yarn businesses.</p>

Source: Compiled by the Commission mainly from the 10-K and 10-Q Forms filed with the SEC by the listed companies during 1998-2000, found on the Internet and retrieved August 1999 through July 2000; and from other industry sources, such as company news releases and annual reports. The 10-K Forms are available from the SEC Web site at <[www.sec.gov/Archives/edgar/data](http://www.sec.gov/Archives/edgar/data)>.



**APPENDIX B**  
**TARIFF AND TRADE AGREEMENT**  
**TERMS**

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# TARIFF AND TRADE AGREEMENT TERMS

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In the *Harmonized Tariff Schedule of the United States* (HTS), chapters 1 through 97 cover all goods in trade and incorporate in the tariff nomenclature the internationally adopted Harmonized Commodity Description and Coding System through the 6-digit level of product description. Subordinate 8-digit product subdivisions, either enacted by Congress or proclaimed by the President, allow more narrowly applicable duty rates; 10-digit administrative statistical reporting numbers provide data of national interest. Chapters 98 and 99 contain special U.S. classifications and temporary rate provisions, respectively. The HTS replaced the *Tariff Schedules of the United States* (TSUS) effective January 1, 1989.

Duty rates in the *general* subcolumn of HTS column 1 are normal trade relations rates, many of which have been eliminated or are being reduced as concessions resulting from the Uruguay Round of Multilateral Trade Negotiations. Column 1-general duty rates apply to all countries except those listed in HTS general note 3(b) (Afghanistan, Cuba, Laos, North Korea, and Vietnam) plus Serbia and Montenegro, which are subject to the statutory rates set forth in *column 2*. Specified goods from designated general-rate countries may be eligible for reduced rates of duty or for duty-free entry under one or more preferential tariff programs. Such tariff treatment is set forth in the *special* subcolumn of HTS rate of duty column 1 or in the general notes. If eligibility for special tariff rates is not claimed or established, goods are dutiable at column 1-general rates. The HTS does not enumerate those countries as to which a total or partial embargo has been declared.

The *Generalized System of Preferences* (GSP) affords nonreciprocal tariff preferences to developing countries to aid their economic development and to diversify and expand their production and exports. The U.S. GSP, enacted in title V of the Trade Act of 1974 for 10 years and extended several times thereafter, applies to merchandise imported on or after January 1, 1976 and before the close of September 30, 2001. Indicated by the symbol "A", "A\*", or "A+" in the special subcolumn, the GSP provides duty-free entry to eligible articles the product of and imported directly from designated beneficiary developing countries, as set forth in general note 4 to the HTS. A related program (see general note 16) established under the *African Growth and Opportunity Act* (AGOA), effective from October 2, 2000, through the close of September 30, 2008, provides duty-free entry to other eligible goods the product of and imported directly from qualified, designated sub-Saharan African beneficiary countries, as indicated by the symbol "D" in the special subcolumn; additional tariff benefits are authorized for specified textile and apparel products under subchapter XIX of chapter 98 of the HTS.

The *Caribbean Basin Economic Recovery Act* (CBERA) affords nonreciprocal tariff preferences to developing countries in the Caribbean Basin area to aid their economic development and to diversify and expand their production and exports. The CBERA, enacted in title II of Public Law 98-67, implemented by Presidential Proclamation 5133 of November 30, 1983, and amended by the Customs and Trade Act of 1990, applies to merchandise entered, or withdrawn from warehouse for consumption, on or after January 1, 1984. Indicated by the symbol "E" or "E\*" in the special subcolumn, the CBERA provides duty-free entry to eligible articles, and reduced-duty treatment to certain other

articles, which are the product of and imported directly from designated countries, as set forth in general note 7 to the HTS. A related program (see general note 17) enacted in the *United States-Caribbean Basin Trade Partnership Act* and known as the CBTPA is effective from October 2, 2000, through the close of September 30, 2008 (unless beneficiary countries earlier join a possible Free Trade Area of the Americas). Indicated by the symbol "R" in the special subcolumn in chapters 1 through 97 of the HTS, the CBTPA provides duty-free or reduced-duty entry (identical to the rate of duty in effect for like goods of Mexico under the terms of general note 12) to certain products of qualified, designated CBTPA beneficiary countries imported directly therefrom; such tariff treatment is also provided to specified textile and apparel products under the provisions of subchapter XX of chapter 98 of the HTS.

Free rates of duty in the special subcolumn followed by the symbol "IL" are applicable to products of Israel under the *United States-Israel Free Trade Area Implementation Act* of 1985 (IFTA), as provided in general note 8 to the HTS.

Preferential nonreciprocal duty-free or reduced-duty treatment in the special subcolumn followed by the symbol "J" or "J\*" in parentheses is afforded to eligible articles the product of designated beneficiary countries under the *Andean Trade Preference Act* (ATPA), enacted as title II of Public Law 102-182 and implemented by Presidential Proclamation 6455 of July 2, 1992 (effective July 22, 1992), as set forth in general note 11 to the HTS.

Preferential free rates of duty in the special subcolumn followed by the symbol "CA" are applicable to eligible goods of Canada, and rates followed by the symbol "MX" are applicable to eligible goods of Mexico, under the *North American Free Trade Agreement*, as provided in general note 12 to the HTS and implemented effective January 1, 1994 by Presidential Proclamation 6641 of December 15, 1993. Goods must originate in the NAFTA region under rules set forth in general note 12(t) and meet other requirements of the note and applicable regulations.

Other special tariff treatment applies to particular *products of insular possessions* (general note 3(a)(iv)), *products of the West Bank and Gaza Strip* (general note 3(a)(v)), goods covered by the *Automotive Products Trade Act* (APTA) (general note 5) and the *Agreement on Trade in Civil Aircraft* (ATCA) (general note 6), *articles imported from freely associated states* (general note 10), *pharmaceutical products* (general note 13), and *intermediate chemicals for dyes* (general note 14).

The *General Agreement on Tariffs and Trade 1994* (GATT 1994), pursuant to the Agreement Establishing the World Trade Organization, is based upon the earlier GATT 1947 (61 Stat. (pt. 5) A58; 8 UST (pt. 2) 1786) as the primary multilateral system of disciplines and principles governing international trade. Signatories' obligations under both the 1994 and 1947 agreements focus upon most-favored-nation treatment, the maintenance of scheduled concession rates of duty, and national treatment for imported products; the GATT also provides the legal framework for customs valuation standards, "escape clause" (emergency) actions, antidumping and countervailing duties, dispute settlement, and other measures. The results of the Uruguay Round of multilateral tariff negotiations are set forth by way of separate schedules of concessions for each participating contracting party, with the U.S. schedule designated as Schedule XX. Pursuant to the *Agreement on Textiles and Clothing* (ATC) of the GATT 1994, member countries are phasing out restrictions on imports under the prior "Arrangement Regarding International Trade in Textiles" (known

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as the **Multifiber Arrangement (MFA)**). Under the MFA, which was a departure from GATT 1947 provisions, importing and exporting countries negotiated bilateral agreements limiting textile and apparel shipments, and importing countries could take unilateral action in the absence or violation of an agreement. Quantitative limits had been established on imported textiles and apparel of cotton, other vegetable fibers, wool, man-made fibers or silk blends in an effort to prevent or limit market disruption in the importing countries. The ATC establishes notification and safeguard procedures, along with other rules concerning the customs treatment of textile and apparel shipments, and calls for the eventual complete integration of this sector into the GATT 1994 over a ten-year period, or by Jan. 1, 2005.