

SIGNIFICANT POINTS

- More than 40 percent of all workers are sewing machine operators.
- Primarily due to increased imports and the adoption of new technology, apparel manufacturing is projected to lose 245,000 jobs—more than almost any other industry—over the 2002-12 period.
- Average earnings are below those of other manufacturing industries.

Nature of the Industry

Workers in the apparel industry transform fabrics produced by textile manufacturers into clothing and accessories that fill the Nation's retail stores. By cutting and sewing fabrics or other materials, such as leather, rubberized fabrics, plastics, and furs, workers in this industry help to keep us warm, dry, and in style.

The apparel industry traditionally has consisted mostly of production workers who performed the cutting and sewing functions in an assembly line. This industry remains a labor-intensive one, despite advances in technology and workplace practices. Although many workers still perform this work in the United States, the industry is increasingly opening factories in other countries or contracting out its production work to foreign suppliers to take advantage of other countries' lower labor costs. In its place, a growing number of apparel manufacturers are performing only the entrepreneurial functions involved in apparel manufacturing. These include buying raw materials, designing clothes and accessories and preparing samples, arranging for the production and distribution of the apparel, and marketing the finished product.

Many of the remaining production workers work in teams, in which garments are made by a group of sewing machine operators organized into a production "module." Each operator in a module is trained to perform nearly all of the functions required to assemble a garment. Each team is responsible for its own performance, and individuals usually receive compensation based on the team's performance.

Technology affecting the apparel industry includes computerized equipment and material transport systems. Computers and computer-controlled equipment aid in many functions, such as design, patternmaking, and cutting. Wider looms, more computerized equipment, and the increasing use of robotics to move material within the plant are other technologies recently designed to make the production plant more efficient. Despite these changes, however, the apparel industry—especially its sewing function—has remained significantly less automated than many other manufacturing industries.

One of the best assets that the domestic industry has over its competition from abroad is its closeness to the market and its ability to react to changes in fashion more quickly than can its foreign competitors. Also, as retailers consolidate and become more cost conscious, they are requiring more apparel

manufacturers to move towards a just-in-time delivery system, in which purchased apparel items are quickly replaced by the manufacturer rather than from a large inventory kept by the retailer. Through electronic data interchange—mainly using barcodes—information is quickly communicated to the manufacturers, providing information not only on inventory, but also about the desires of the public for fashion items.

Apparel firms have responded to growing competition by merging and moving into the retail market. They are also contracting out functions in addition to the production of garments—for example, the warehousing and order fulfillment functions—so that they can concentrate on their strengths of design and marketing. Such changes may help the apparel manufacturing industry to continue to supply the Nation's consumers with garments at acceptable cost and thus meet the growing competition.

Working Conditions

Working conditions depend on the age of the facility, the equipment used, and company policies. Cut and sew apparel workers work an average of 36.4 hours weekly, but overtime is common during periods of peak production. Some firms in the industry operate several shifts, and may require employees to work nights or weekends. As more expensive machinery is introduced, companies may add shifts to keep the machines from being idle.

Factories are generally clean, well lit, and well ventilated, but sewing areas may be noisy. Operators often sit for long periods and lean over machines. New ergonomically designed chairs and machines that allow workers to stand during operation are some of the means that firms use to minimize discomfort for production workers. Another concern for workers is injuries caused by repetitive motions. The implementation of modular units and specially designed equipment reduces potential health problems by lessening the stress of repetitive motions. In 2002, cases of work-related injury and illness in the apparel industry averaged 4.6 per 100 workers, lower than the 7.2 average in all manufacturing industries, and about the same as the rate for all industries.

The movement away from traditional piecework systems often results in a significant change in working conditions. Modular manufacturing involves teamwork, increased responsibility, and greater interaction among coworkers than do traditional assembly lines.

Travel is an important part of the job for many managers and designers, who oversee the design and production of the apparel. As more production moves abroad, foreign travel is becoming more common.

Employment

The apparel industry provided about 358,000 wage and salary jobs in 2002. As shown in table 1, employment is classified into three sub industries; apparel knitting mills, cut and sew apparel manufacturing, and accessories and other apparel manufacturing. Within the cut and sew apparel manufacturing sub industry, cut and sew apparel contractors held approximately 40 percent of all jobs and men's and women's cut and sew apparel manufacturing accounted for about 51 percent of employment.

About three-fourths of jobs in the apparel industry are found in nine States: Alabama, California, Georgia, New Jersey, New York, North Carolina, Pennsylvania, Tennessee, and Texas. The industry had about 14,000 establishments in 2002, with employment concentrated in large firms. In 2002, 2 out of 3 jobs were in establishments with 50 or more workers (chart).

Table 1. Percent distribution of establishments and employment in apparel manufacturing, 2002

Industry segment	Establishments	Employment
Total	100.0	100.0
Cut and sew apparel manufacturing	87.1	78.3
Accessories and other apparel manufacturing	7.3	7.5
Apparel knitting mills	5.6	14.2

Occupations in the Industry

Production workers account for about 70 percent of total employment in the industry. About 4 in 10 workers are sewing machine operators (table 2). The apparel industry also em-

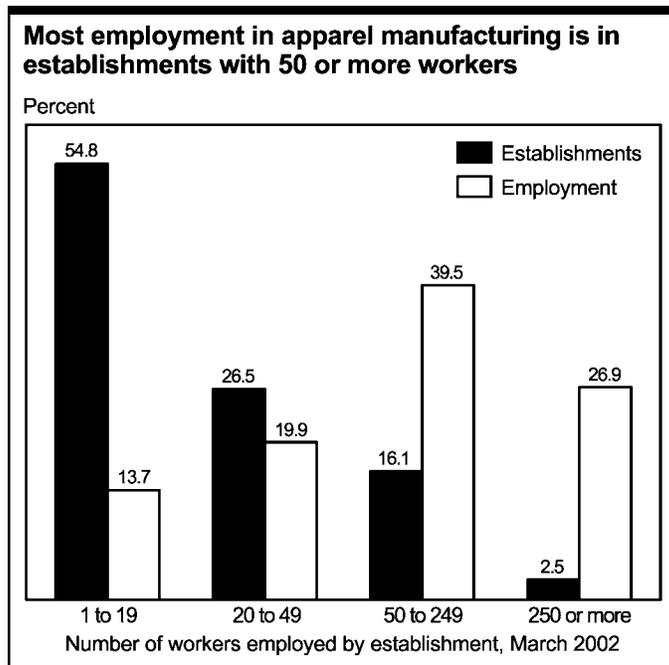
Table 2. Employment of wage and salary workers in apparel manufacturing by occupation, 2002 and projected change, 2002-12 (Employment in thousands)

Occupation	Employment, 2002		Percent change, 2002-10
	Number	Percent	
All occupations	358	100.0	-68.6
Management, business, and financial occupations	16	4.4	-66.9
Top executives	6	1.5	-67.9
Operations specialties managers	5	1.3	-66.4
Professional and related occupations	7	1.9	-66.2
Fashion designers	2	0.6	-64.78
Service occupations	4	1.2	-69.3
Sales and related occupations	10	2.7	-69.5
Sales representatives, wholesale and manufacturing, except technical and scientific products	4	1.2	-67.7
Office and administrative support occupations	40	11.2	-72.0
Bookkeeping, accounting, and auditing clerks	4	1.0	-72.75
Information and record clerks	6	1.7	-70.2
Shipping, receiving, and traffic clerks	9	2.5	-72.1
Stock clerks and order fillers	4	1.1	-74.7
Office clerks, general	4	1.2	-72.1
Installation, maintenance, and repair occupations	7	1.9	-61.8
Industrial machinery installation, repair, and maintenance workers	6	1.6	-61.4
Production occupations	249	69.6	-68.3
First-line supervisors/managers of production and operating workers	11	3.1	-66.8
Team assemblers	5	1.3	-59.7
Pressers, textile, garment, and related materials	10	2.8	-67.5
Sewing machine operators	147	41.1	-69.5
Sewers, hand	8	2.4	-67.1
Tailors, dressmakers, and custom sewers	3	1.0	-75.50
Textile cutting machine setters, operators, and tenders	9	2.5	-71.1
Textile knitting and weaving machine setters, operators, and tenders	9	2.5	-59.5
Fabric and apparel patternmakers	4	1.2	-72.1
All other textile, apparel, and furnishings workers	6	1.8	-64.9
Inspectors, testers, sorters, samplers, and weighers	12	3.5	-66.4
Helpers—Production workers	4	1.2	-69.9
Transportation and material moving occupations	25	7.0	-69.7
Laborers and freight, stock, and material movers, hand	9	2.5	-73.3
Packers and packagers, hand	11	3.1	-67.0

NOTE: May not add to totals due to omission of occupations with small employment.

ploy a small number of workers in administrative support, material-moving, and managerial occupations.

Fashion designers are the artists of the apparel industry. They create ideas for a range of products including coats, suits, dresses, hats, and underwear. Fashion designers begin the pro-



cess by making rough sketches of garments or accessories, often using computer-assisted design (CAD) software. This software prints detailed designs from a computer drawing. It can also store fashion styles and colors that can be accessed and easily changed. Designers then create the pattern pieces that will be used to construct the finished garment. They measure and draw pattern pieces to actual size on paper. Then, they use these pieces to measure and cut pattern pieces in a sample fabric. Designers sew the pieces together and fit them on a model. They examine the sample garment and make changes until they get the effect they want. Some designers use assistants to cut and sew pattern pieces to their specifications.

Before sewing can begin, pattern pieces must be made, layouts determined, and fabric cut. *Fabric and apparel patternmakers* create the “blueprint” or pattern pieces for a particular apparel design. This often involves “grading,” or adjusting the pieces for different sized garments. Grading once was a time-consuming job, but now it is quickly completed with the aid of a computer. *Markers* determine the best arrangement of pattern pieces to minimize wasted fabric. Traditionally, markers judged the best arrangement of pieces by eye; today, computers quickly help to determine the best layout.

The layout arrangement is then given to *cutters*. In less automated companies, cutters may use electric knives or cutting machines to cut pattern pieces. In more automated facilities, markers electronically send the layout to a computer-controlled cutting machine, and *textile cutting machine setters, operators, and tenders* monitor the machine’s work.

Sewing machine operators assemble or finish clothes. Most sewing functions are specialized and require the operator to receive specific training. Although operators specialize in one function, the trend toward cross-training requires them to broaden their skills. *Team assemblers* perform all of the assembly tasks assigned to their team, rotating through the different tasks, rather than specializing in a single task. They also may decide how the work is to be assigned and how different tasks are to be performed.

Pressers receive a garment after it has been assembled. Pressers eliminate wrinkles and give shape to finished products. Most pressers use specially formed, foot-controlled pressing machines to perform their duties. Some pressing machines now have the steam and pressure controlled by computers. *Inspectors, testers, sorters, samplers, and weighers* inspect the finished product to ensure consistency and quality.

Training and Advancement

Most production workers are trained on the job. Although a high school diploma is not required, some employers prefer it. Basic math and computer skills are important for computer-controlled machine operators.

Cutters and pressers are trained on the job, while patternmakers and markers usually have technical or trade school training. All of these workers must understand textile characteristics and have a good sense of three-dimensional space. Traditional cutters need exceptional hand-eye coordination. Computers are becoming a standard tool for these occupations because patternmakers and markers increasingly design pattern

pieces and layouts on a computer screen. New entrants seeking these jobs should learn basic computer skills. Those running automatic cutting machines could need technical training, which is available from vocational schools.

Sewing machine operators must have good hand-eye coordination and dexterity, as well as an understanding of textile fabrics. They normally are trained on the job for a period of several weeks to several months, depending on their previous experience and the function for which they are training. Operators usually begin by performing simple tasks, working their way up to more difficult assemblies and fabrics as they gain experience.

Modular manufacturing requires operators to perform more than one function, so they usually are trained to perform several duties. In addition to this functional training, workers in a modular system may also be offered courses in the interpersonal and communication skills necessary to work as part of a team. Further, the added responsibility of self-managing their modules may lead these workers to receive training in problem-solving and management.

Advancement for sewing machine operators, however, is limited. Advancement often takes the form of higher wages as workers become more experienced. Experienced operators who have good people and organization skills may become supervisors. Operators with a high school diploma and some vocational school training have more chances for advancement.

Designers need a good sense of color, texture, and style. In addition, they must understand the construction and characteristics of specific fabrics, such as durability and stiffness. Many employers seek designers who know how to use computer-assisted design. This specialized training usually is obtained through a university or design school that offers 4-year or 2-year degrees in art, fine art, or fashion design. Many schools do not allow entry into a bachelor’s degree program until a student has completed a year of basic art and design courses. Applicants may be required to submit drawings and other examples of their artistic ability. Formal training is also available in 2- and 3-year fashion design schools that award certificates or associate degrees. Graduates of 2-year programs generally qualify as assistants to designers.

Beginning designers usually receive on-the-job training. They normally need 1 to 3 years of training before they advance to higher level positions, such as assistant technical designer, pattern designer, or head designer. Sometimes fashion designers advance by moving to bigger firms. Some designers choose to move into positions in business or merchandising.

Those interested in engineering or production management need a bachelor’s degree. Degrees in mechanical, chemical, or industrial engineering are common, but employers may also accept degrees in related studies. A few programs offer concentrations in apparel and textile production that focus on the unique characteristics and issues associated with apparel production. Universities offering these specializations generally are found in the South and Northeast.

Earnings

Average weekly earnings for production workers were \$334 in 2002, significantly lower than the overall \$619 per week in

manufacturing and \$506 in the entire private sector. Table 3 shows average weekly and hourly earnings in various segments of the apparel industry.

Table 3. Average earnings of nonsupervisory workers in apparel manufacturing, 2002

Industry segment	Weekly	Hourly
Total, private industry	\$506	\$14.95
Apparel Manufacturing	334	9.10
Apparel knitting mills	382	10.08
Accessories and other apparel	348	9.41
Cut and sew apparel	324	8.89

Earnings in selected occupations in apparel and other textile products appear in table 4. Traditionally, sewing machine operators are paid on a piecework basis determined by the quantity of goods they produce. Many companies are changing to incentive systems based on group performance that consider both the quantity and quality of the goods produced. A few companies pay production workers a salary.

Table 4. Median hourly earnings of the largest occupations in apparel manufacturing, 2002

Occupation	Apparel Manufacturing	All industries
First-line supervisors/managers of production and operating workers	\$14.27	\$20.64
Textile knitting and weaving machine setters, operators, and tenders	9.65	11.05
Textile cutting machine setters, operators, and tenders	9.48	9.77
Shipping, receiving, and traffic clerks	9.31	11.26
Pressers, textile, garment, and related materials	8.83	8.21
Team assemblers	8.60	10.90
Laborers and freight, stock, and material movers, hand	8.51	9.48
Sewers, hand	8.16	8.69
Packers and packagers, hand	8.07	8.03
Sewing machine operators	7.72	8.39

Relatively few workers in the apparel industry belong to unions. About 8 percent of apparel workers are union members or are covered by a union contract, compared with 15 percent for the economy as a whole. The major union in the apparel industry is the Union of Needletrades, Industrial, and Textile Employees (UNITE), which was formed in 1995 from the International Ladies' Garment Workers Union and the Amalgamated Clothing and Textile Workers Union.

Outlook

Wage and salary employment in the apparel industry is expected to decline 69 percent through 2012, compared with an increase of 16 percent for all industries combined. The expected decline translates into 245,000 lost jobs over the period—greater than the decrease for almost any other industry. Declining employment will be caused by growing imports, new automation, fierce cost-cutting pressures imposed

by retailers, international competition, and mergers and acquisitions. Nevertheless, some job openings will arise as experienced workers transfer to other industries or retire or leave the workforce for other reasons.

Changing trade regulations are the single most important factor influencing future employment patterns. Because the apparel industry is labor-intensive, it is especially vulnerable to import competition from nations in which workers receive lower wages. The protection provided to the domestic apparel industry over the past two decades will be significantly reduced in coming years, permitting more apparel imports. For example, starting in 2004, all quotas for apparel and textile products will be lifted among members of the World Trade Organization, which includes most U.S. trading partners, and, in particular, China. Because many U.S. firms will continue to move their assembly operations to low-wage countries, this trend is likely to affect the jobs of lower skilled machine operators most severely. It will not, however, have as adverse an effect on the demand for some of the presewing functions, such as designing and cutting, because much of the apparel will still be designed and cut in the United States.

New technology will increase the apparel industry's productivity, but, unlike other industries, the apparel industry is likely to remain labor intensive. The variability of cloth and the intricacy of the cuts and seams of the assembly process have been difficult to automate. Machine operators, therefore, will continue to perform most sewing tasks, and automated sewing will be limited to simple functions. In some cases, however, computerized sewing machines will increase the productivity of operators and reduce required training time.

Technology also is increasing the productivity of workers who perform other functions, such as designing, marking, cutting, and pressing. Computers and automated machinery will continue to raise productivity and reduce the demand for workers in these areas, but the decline will be moderated by growth in demand for the services of these workers generated by offshore assembly sites. The increasing rate at which fashions change also will boost demand for workers employed in those U.S.-based firms that have quick-response capabilities.

Continuing changes in the market for apparel goods will exert cost-cutting pressures that affect all workers in the apparel and textile industries. As consumers become more price conscious, retailers gain bargaining power over apparel producers, and increasing competition limits the ability of producers to pass on costs to consumers, apparel firms are likely to respond by relying more on foreign production and boosting productivity through investments in technology and new work structures. These responses will adversely affect employment of U.S. apparel workers.

The trend today is for apparel firms to merge or consolidate to remain competitive. This trend continues to drive down the number of firms in this industry. In the future, the apparel industry will be dominated by highly efficient, profitable organizations that have developed their dominance through well-recognized strategies that enable them to be among the lowest

cost producers of apparel. Consolidation and mergers are likely to result in layoffs of some workers.

Sources of Additional Information

Information about job opportunities in technical and design occupations in the apparel industry can be obtained from colleges offering programs in textile and apparel engineering, production, and design.

Information on many occupations in apparel manufacturing, including those listed below, appears in the 2004-05 edition of the *Occupational Outlook Handbook*:

- Designers
- Engineers
- Inspectors, testers, sorters, samplers, and weighers
- Textile, apparel, and furnishings occupations