work is located. Workers covered by union contracts usually had higher earnings.

**Related Occupations**

Other workers who set up and operate production machinery include machine setters, operators, and tenders—metal and plastic, bookbinders and bindery workers, and various precision machine operators.

**Sources of Additional Information**

Details about apprenticeships and other training opportunities may be obtained from local employers such as newspapers and printing shops, local offices of the Graphic Communications International Union, local affiliates of Printing Industries of America, or local offices of the State employment service.

For general information about press operators, write to:

- Graphic Communications International Union, 1900 L St. NW., Washington, DC 20036. Internet: [http://www.gciu.org](http://www.gciu.org)

For information on careers and training in printing and the graphic arts, write to:

- Printing Industries of America, 100 Daingerfield Rd., Alexandria, VA 22314. Internet: [http://www.gain.org/servlet/gateway/PIA_GATF/non_index.html](http://www.gain.org/servlet/gateway/PIA_GATF/non_index.html)

### Textile, Apparel, and Furnishings Occupations

(O*NET 51-6011.01, 51-6011.02, 51-6011.03, 51-6021.01, 51-6021.02, 51-6021.03, 51-6031.01, 51-6031.02, 51-6041.00, 51-6042.00, 51-6051.00, 51-6052.01, 51-6052.02, 51-6061.00, 51-6062.00, 51-6063.00, 51-6064.00, 51-6091.01, 51-6092.00, 51-6093.00, 51-6099.99)

**Significant Points**

- Most workers learn through on-the-job training.
- Employment is expected to decline for most occupations, primarily due to increased imports, laborsaving machinery, and offshore assembly.
- Earnings of most workers are low.

**Nature of the Work**

Textiles and leather clothe our bodies, cover our furniture, and adorn our homes. Textile, apparel, and furnishings workers produce these materials and fashion them into a wide range of products that we use in our daily lives. Jobs range from those that employ computers, to those that operate large industrial machinery and smaller power equipment, to those that involve substantial handwork.

**Textile machine operators.** Textile machinery operators run machines that make textile products from fibers. Textiles are the basis of towels, bed linens, hosiery and socks, and nearly all clothing, but they also are a key ingredient of products ranging from roofing to tires. The first step in manufacturing textiles is preparing the natural or synthetic fibers. Extruding and forming machine operators, synthetic and glass fibers set up and operate machines that extrude—or force—liquid synthetic material such as rayon, fiberglass, or liquid polymers out through small holes and draw out filaments. Other operators put natural fibers such as cotton, wool, flax, or hemp through carding and combing machines that clean and align them into short lengths called “sliver.” When sliver is produced, different types of natural fibers and synthetics filaments may be combined to give the product a desired texture, durability, or other characteristics. Textile winding, twisting, and drawing out machine operators take the sliver and draw out, twist, and wind it to produce yarn, taking care to repair any breaks.

**Textile bleaching and dyeing machine operators** control machines that wash, bleach, or dye either yarn or finished fabrics and other products. Textile knitting and weaving machine operators put the yarn on machines that weave, knit, loop, or tuft it into a product. Woven fabrics are used to make apparel and other goods, while some knitted products—such as hosiery—and tufted products—such as carpeting—emerge in near finished form. Different types of machines are used for these processes, but operators perform similar tasks. They repair breaks in the yarn and monitor the yarn supply, while tending many machines at once. Textile cutting machine operators trim the fabric into various widths and lengths, depending on its intended use.

**Apparel workers.** Apparel workers cut fabric and other materials and sew it into clothing and related products. Workers in a variety of occupations fall under the heading of apparel workers. Tailors, dressmakers, and sewers make custom clothing and alter and repair garments for individuals. However, workers in most apparel occupations are found in manufacturing where they perform specialized tasks in the production of large numbers of garments that are shipped to retail establishments for sale to the public.

Fabric and apparel patternmakers convert a clothing designer’s original model of a garment into a pattern of separate parts that can be laid out on a length of fabric. After discussing the item with the designer, these skilled workers usually use a computer to outline the parts and draw in details to indicate the position of pleats, buttonholes, and other features. (In the past, patternmakers laid out the parts on paper using pencils and drafting instruments, such as rulers.) Patternmakers then alter the size of the pieces in the pattern to produce garments of various sizes, and may “mark” the fabric showing the best layout of pattern pieces to minimize waste of material.

Once an item’s pattern has been made and marked, mass production of the garment begins. Cutters and trimmers take the patterns and cut out material. They must pay close attention to their work because mistakes are costly. They place multiple layers of material on the cutting table and use an electric knife or other cutting tools to cut out the various pieces of the garment following the outline of the pattern; delicate materials may be cut by hand. In some companies, computer-controlled machines do the cutting.

Sewing machine operators join the parts together, reinforce seams, and attach buttons, hooks, zippers, and accessories to produce clothing. After the product is sewn, other workers remove lint and loose threads and inspect and package the garments.

**Shoe and leather workers.** Shoe and leather workers are employed either in manufacturing or in personal services. In shoe manufacturing, shoe machine operators and tenders operate a variety of specialized machines that perform cutting, joining, and finishing functions. In personal services, shoe and leather workers and repairers perform a variety of repairs and custom leatherwork for members of the general public. The construct, decorate, or repair
shoes, belts, purses, saddles, luggage, and other leather products. They also may repair some products made of canvas or plastic. When making custom shoes or modifying existing footwear for people with foot problems or special needs, they cut pieces of leather, shape them over a form shaped like a foot, and sew them together. They then attach soles and heels using sewing machines or cement and nails. They also dye and polish the items using a buffing wheel for a smooth surface and lustrous shine. When making luggage, they fasten leather to a frame and attach handles and other hardware. They also cut and secure linings inside the frames and sew or stamp designs onto the luggage exterior. In addition to the steps listed above, saddle makers often apply leather dyes and liquid topcoats to produce a gloss finish on a saddle. They may also decorate the saddle surface by hand stitching or by stamping the leather with decorative patterns and designs. Shoe and leather workers and repairers who own their own shops keep records and supervise other workers.

**Upholsterers.** Upholsterers make, fix, and restore furniture that is covered with fabric. Upholsterers who restore furniture remove old fabric and stuffing to get back down to the springs and wooden frame. They use hammers and tack pullers to remove the old parts. They reglue loose sections of the frame and refinish exposed wood. The springs sit on a cloth mat, called webbing, that is attached to the frame. Upholsterers replace torn webbing and examine the springs and replace broken or bent ones.

Upholsterers who make new furniture start with a bare wooden frame. First, they install webbing, tacking it to one side of the frame, stretching it tight, and tacking it to the other side. Then, they tie each spring to the webbing and to its neighboring springs. Upholsterers next cover the springs with filler, such as foam or a polyester batt or similar fibrous batting material, to form a smooth, rounded surface. They then measure and cut fabric for the arms, backs, seats, sides, and other surfaces, leaving as little waste as possible. They sew the fabric pieces together and attach them to the frame using tacks, staples, or glue. Lastly, they attach any ornaments, such as fringes, buttons, or rivets.

**Laundry and drycleaning workers.** Laundry and drycleaning workers clean cloth garments, linens, draperies, blankets, and other articles. They also may clean leather, suede, furs, and rugs. When necessary, they treat spots and stains on articles before laundering or drycleaning. The tend machines during cleaning and ensure that items are not lost or misplaced with those of another customer. Pressers, textile, garment, and related materials shape and remove wrinkles from items after cleaning by steam pressing or ironing by hand. Workers then assemble each customer’s items, box or bag them, and prepare an itemized bill for the customer.

**Working Conditions**

Most persons in textile, apparel and furnishings occupations work a standard 5-day, 35- to 40-hour week. Evenings and weekend work is common for shoe and leather workers, laundry and drycleaning workers, and tailors, dressmakers, sewers employed in retail stores. In manufacturing, some employers add second shifts to justify the expense of new machinery. Many textile and fiber mills often use rotating schedules of shifts so that employees do not continuously work nights or days. But these rotating shifts sometimes cause workers to have sleep disorders and stress-related problems.

While much of the work in apparel manufacturing still is based on a piecework system that allows for little interpersonal contact, some apparel firms are placing more emphasis on teamwork and cooperation. Under this new system, individuals work closely with one another and each team or module often governs itself, increasing the overall responsibility of each operator.

Working conditions vary by establishment and by occupation. In manufacturing, machinery in textile mills often is noisy, as are areas in which sewing and pressing are performed in apparel factories; patternmaking and spreading areas tend to be much quieter. Many older factories are cluttered, hot, and poorly lit and ventilated, but more-modern facilities usually have more workspace and are well-lit and ventilated. Textile machinery operators use protective glasses and masks that cover their noses and mouths to protect against airborne materials. Many machines operate at high speeds, and textile machinery workers must be careful not to wear clothing or jewelry that could get caught in moving parts. In addition, extruding and forming machine operators wear protective shoes and clothing when working with certain chemical compounds.

Work in apparel production can be physically demanding. Some workers sit for long periods, and others spend many hours on their feet, leaning over tables and operating machinery. Operators must be attentive while running equipment such as sewing machines, pressers, and automated cutters. A few workers wear protective devices such as gloves. In some instances, new machinery and production techniques have decreased the physical demands upon workers. For example, newer pressing machines now are operated by foot pedals or computer controls, and do not require much strength to operate.

Laundries and drycleaning establishments often are hot and noisy; but those in retail stores tend to be less noisy and more comfortable. Areas in which shoe and leather workers make or repair shoes and other leather items can be noisy and odors from leather dyes and stains often are present. Workers need to pay close attention.
when working with machines to avoid punctures, lacerations, and abrasions.

Upholstery work is not dangerous, but upholsterers usually wear protective gloves and clothing when using sharp tools and lifting and handling furniture or springs. Upholsterers stand most of the workday and may do a lot of bending and heavy lifting. They also may work in awkward positions for short periods.

**Employment**

Textile, apparel, and furnishings workers held over 1.3 million jobs in 2000. Employment in the detailed occupations that make up this group was distributed as follows:

- **Sewing machine operators** ........................................... 399,000
- **Laundry and drycleaning workers** ................................. 236,000
- **Pressers, textile, garment, and related materials** .............. 110,000
- **Tailors, dressmakers, and sewers** ................................ 101,000
- **All other textile, apparel, and furnishings workers** .......... 95,000
- **Textile winding, twisting, and drawing out machine setters, operators, and tenders** .................. 90,000
- **Textile knitting and weaving machine setters, operators, and tenders** ........................................... 70,000
- **Upholsterers** .............................................................. 58,000
- **Extruding and forming machine setters, operators, and tenders, synthetic and glass fibers** .............. 41,000
- **Textile cutting machine setters, operators, and tenders** ... 38,000
- **Textile bleaching and dyeing machine operators and tenders** ...... 37,000
- **Shoe and leather workers and repairers** .......................... 19,000
- **Fabric and apparel patternmakers** .................................. 15,000
- **Shoe machine operators and tenders** .............................. 9,100

Manufacturing jobs are concentrated in California, New York, North Carolina, Pennsylvania, Tennessee, and Georgia. Jobs in reupholstery, shoe repair and custom leather work, and laundry and drycleaning establishments are found in cities and towns throughout the Nation. Only about 7 percent of all workers in textile, apparel, and furnishings occupations were self-employed, compared with more than one-third of tailors, dressmakers, and sewers and more than one-quarter of upholsterers.

**Training, Other Qualifications, and Advancement**

Most employers prefer to hire high school graduates for jobs in textile, apparel, and furnishings occupations. Entrants with postsecondary vocational training or previous work experience in apparel production usually have a better chance of getting a job and advancing to a supervisory position. Regardless of setting, workers usually begin by performing simple tasks.

In manufacturing, textile and apparel workers need good hand-eye coordination, manual dexterity, physical stamina, and the ability to perform repetitive tasks for long periods. Machine operators usually are trained on the job by more-experienced employees or by machinery manufacturers’ representatives. As they gain experience, they are assigned more difficult operations. Further advancement is limited, however. Some production workers may become first-line supervisors, but most can advance only to more-skilled operator jobs. As machinery in the industry continues to become more complex, knowledge of the basics of computers and electronics will increasingly be an asset. In addition, the trends toward cross-training of operators and working in teams will increase the time needed to become fully trained on all machines and require interpersonal skills to work effectively with others.

Retailers prefer to hire custom tailors, dressmakers, and sewers with previous experience in apparel manufacture, design, or alteration. Knowledge of fabrics, design, and construction is very important. Some experienced custom tailors open their own tailoring shop. Custom tailoring is a very competitive field, however, and training in small-business operations can mean the difference between success and failure. Although laundries and drycleaners prefer entrants with previous work experience, they routinely hire inexperienced workers.

Precision shoe and leather workers and repairers generally learn their skills on the job. Manual dexterity and the mechanical aptitude to work with handtools and machines are important in shoe repair and leather working. Shoe and leather workers who produce custom goods should have artistic ability as well. Beginners start as helpers for experienced workers but, in manufacturing, they may attend more-formal in-house training programs. Trainees generally become fully skilled in 6 months to 2 years. Shoe repairers need to keep their skills up-to-date to work with the rapidly changing footwear styles and materials. Some do this by attending trade shows, while others attend specialized training seminars and workshops in custom shoe making, shoe repair, and other leather work sponsored by associations. Skilled workers who produce and modify prescription footwear may become certified as pedorthists by the Pedorthic Footwear Association after completing 120 hours of training and passing an examination. Some in the shoe and leather working occupations begin as workers or repairers and advance to salaried supervisory and managerial positions. Some open their own shop, but knowledge of business practices and management and a pleasant manner when dealing with customers are needed to stay in business.

Most upholsterers learn their skills on the job, but a few learn their skills through apprenticeships. Inexperienced persons also may take training in basic upholstery in vocational schools and some community colleges. Upholsterers should have manual dexterity, good coordination, and the strength needed to lift heavy furniture. An eye for detail, a flair for color, and the ability to use fabrics creatively also are helpful. It takes about 3 years of on-the-job training for beginners hired as helpers to become fully skilled upholsterers. The primary forms of advancement for upholsterers are opening their own shop or moving into management. The upholstery business is very competitive, so operating a shop successfully is difficult. In large shops and factories, experienced or highly skilled upholsterers may become supervisors or sample makers.

**Job Outlook**

Employment of textile, apparel, and furnishings workers is expected to decline through 2010. Apparel workers have been among the most rapidly declining occupational groups in the economy, and increasing imports, the use of offshore assembly, and greater productivity through new automation will contribute to additional job losses. Because of the large size of this occupation, however, many thousands of job openings will arise each year from the need to replace persons who transfer to other occupations, retire, or leave the occupation for other reasons.

Employment in the domestic textile and apparel industries has declined in recent years as foreign producers have gained a greater share of the U.S. market. Imports are expected to continue to increase—and domestic output and employment decrease—as the U.S. market is opened further by the North American Free Trade Agreement (NAFTA), the Agreement on Textiles and Clothing (ATC) of the World Trade Organization, and the Caribbean Basin Initiative. NAFTA and the Caribbean Basin Initiative allow most apparel produced in Mexico, Canada, and many other Western Hemisphere countries to be imported duty-free to the United States. The ATC, as it is phased in, will result in the elimination of quotas and a reduction in tariffs for many apparel products produced in additional countries. Domestic production—especially of apparel—will continue to move abroad and imports to the U.S. market will increase. Declines in U.S. apparel production will cause declines in
domestic textile production because the apparel industry is the largest consumer of American-made textiles.

Domestic apparel manufacturers are developing the ability to take advantage of their close proximity to the U.S. market by responding more quickly to changes in market demand. U.S. producers use computers and electronic data interchange with retailers to closely monitor the sales of the items that they produce and to replenish diminishing inventories quickly. They are, therefore, able to keep retailers stocked with the most popular items and to cut back production of apparel that is not selling well.

Fierce competition in the market for apparel will keep domestic apparel and textile firms under intense pressure to cut costs and produce more with fewer workers. The textile industry already is highly automated but it will continue to seek to increase worker productivity through the introduction of laborsaving machinery. Employment is expected to decline as textile firms invest in new equipment, reorganize work practices, and consolidate. New machinery, such as faster air jet looms and computer-integrated manufacturing technology, will allow each operator to monitor a larger number of machines. Many factories are also reorganizing production floors to give workers additional responsibility, further increasing productivity. Also, textile firms are merging to take advantage of economies of scale and to pool resources for investment in new equipment. These practices will make the textile industry increasingly competitive, but they will decrease employment of many machine operator occupations. Persons with technical skills and some computer training will have the best opportunities.

Despite advances in technology, the apparel industry has had difficulty employing automated equipment extensively due to the soft properties of textile products. The industry produces a wide variety of apparel items that change frequently with changes in style and season. Adapting existing technology to the production of apparel is time consuming and expensive, and each change could require retooling. However, some larger firms and those that produce standardized items that change infrequently have automated presewing functions, material handling, and some simple sewing procedures. Technological developments, such as computer-aided marking and grading, computer-controlled cutters, semiautomatic sewing and pressing machines, and automated material handling systems have increased output while reducing the need for some workers in larger firms. Assembly and sewing continues to be the most labor-intensive step in the production of apparel, and increasing numbers of sewing machine operator jobs are expected to be lost to lower-wage workers abroad. But productivity improvements will allow many of the presewing functions of design, patternmaking, marking, and cutting to continue to be done domestically, and employment of workers who perform these functions will not be as adversely affected. However, as the domestic apparel industry continues to restructure and consolidate, more of the smaller, less-efficient producers will lose market share to larger U.S. firms and foreign producers.

Tailors, dressmakers, and sewers, the most skilled apparel workers, also are expected to experience declining employment. Demand for their services will continue to lessen as consumers are increasingly likely to buy new, mass-produced apparel instead of purchasing custom-made apparel or having clothes altered or repaired.

Employment of shoe and leather workers is expected to decline through 2010 due to growing imports of less-expensive shoes and leather goods, increasing productivity of U.S. manufacturers, and the more frequent tendency to buy new shoes rather than repair damaged ones. However, declines are expected to be somewhat offset as more people invest in expensive leather shoes that they will want repaired. Also, as the population continues to age, more people will need custom shoes for health reasons.

Employment of upholsterers is expected to decline through 2010 as firms manufacturing new furniture and automotive seats use more-durable coverings and continue to become more automated and efficient. Demand for the reupholstery of furniture also is expected to decline as the increasing manufacture of new, relatively inexpensive upholstered furniture causes many people to simply replace old, worn furniture. However, demand will continue steady for upholsterers to restore very valuable furniture. Most reupholstery work is labor-intensive and not easily automated. Job opportunities for experienced upholsterers should be good because few young people enter the occupation and few shops offer training.

**Earnings**

Earnings of textile, apparel, and furnishings workers vary by occupation. Because many production workers in apparel manufacturing are paid according to the number of acceptable pieces they or their group produce, their total earnings depend on skill, speed, and accuracy. Workers covered by union contracts tend to have higher earnings. Median hourly earnings by occupation in 2000 were as follows:

- Extruding and forming machine setters, operators, and tenders, synthetic and glass fibers $12.66
- Fabric and apparel patternmakers 11.57
- Upholsterers .......................................................... 11.42
- Textile knitting and weaving machine setters, operators, and tenders 10.32
- Tailors, dressmakers, and custom sewers ............... 10.14
- Textile winding, twisting, and drawing out machine setters, operators, and tenders 9.89
- Textile bleaching and dyeing machine operators and tenders .... 9.42
- All other textile, apparel, and furnishings workers 9.25
- Textile cutting machine setters, operators, and tenders 9.23
- Shoe machine operators and tenders 8.89
- Shoe and leather workers and repairers 8.32
- Sewers, hand ......................................................... 8.09
- Sewing machine operators 7.80
- Pressers, textile, garment, and related materials 7.77
- Laundry and drycleaning workers 7.59

Benefits also vary. A few large employers, for example, include childcare in their benefits package. Apparel workers in retail trade also may receive a discount on their purchases from the company for which they work. In addition, some of the larger manufacturers operate company stores, from which employees can purchase apparel products at significant discounts. Some small firms, however, offer only limited benefits.

**Related Occupations**

Textile, apparel, and furnishings workers apply their knowledge of textiles and leathers to fashion products using hand tools and machinery. Other occupations that produce products using hand tools, machines, and their knowledge of the materials with which they work include assemblers and fabricators, dental laboratory technicians, food processing workers, jewelers and precious stone and metal workers, and woodworkers.

**Sources of Additional Information**

Information about job opportunities in textile, apparel, and furnishings occupations is available from local employers and local offices of the State employment service. For general information on careers, technology, and trade regulations in the textile industry, contact:

- **American Textile Manufacturers Institute, Inc.,** 1130 Connecticut Ave. NW., Suite 1200, Washington, DC 20036-3954.
### Woodworkers

(O*NET 51-7011.00, 51-7021.00, 51-7031.00, 51-7032.00, 51-7041.01, 51-7041.02, 51-7042.01, 51-7042.02, 51-7099.99)

#### Significant Points
- Most woodworkers are trained on the job; basic machine operations may be learned in a few months, but becoming a skilled woodworker often requires 2 or more years.
- Employment is expected to grow more slowly than average—reflecting relatively slow growth among lesser skilled woodworkers.
- Job prospects will be best for highly skilled workers and those with knowledge of computerized numerical control machine tool operation.

#### Nature of the Work
In spite of the development of sophisticated plastics and other materials, the demand for wood products continues unabated. Helping to meet this demand are woodworkers. Woodworkers are found in industries that produce wood, such as sawmills and plywood mills; in industries that use wood to produce furniture, kitchen cabinets, musical instruments, and other fabricated wood products; or in small shops that make architectural woodwork, furniture, and many other specialty items.

All woodworkers are employed at some stage of the process through which logs of wood are transformed into finished products. Some of these workers produce the structural elements of buildings; others mill hardwood and softwood lumber; still others assemble finished wood products. They operate machines that cut, shape, assemble, and finish raw wood to make the doors, windows, cabinets, trusses, plywood, flooring, paneling, molding, and trim that are components of most homes. Others may fashion home accessories, such as beds, sofas, tables, dressers, and chairs. In addition to these household goods, woodworkers also make sporting goods, including baseball bats, racquets, and oars, as well as musical instruments, toys, caskets, tool handles, and thousands of other wooden items.

Production woodworkers set up, operate, and tend woodworking machines such as power saws, planers, sanders, lathes, jointers, and routers that cut and shape components from lumber, plywood, and other wood products. In sawmills, **sawing machine operators and tenders** set up, operate, or tend wood sawing machines that cut logs into planks, timbers, or boards. In plants manufacturing wood products, woodworkers first determine the best method of shaping and assembling parts from blueprints, supervisors’ instructions, or shop drawings that woodworkers themselves produce. Before cutting, they often must measure and mark the materials. They verify dimensions and may trim parts using hand tools such as planes, chisels, wood files, or sanders to insure a tight fit. **Woodworking machine operators and tenders** set up, operate, or tend a specific woodworking machine such as drill presses, lathes, shapers, routers, sanders, planers, and wood-nailing machines. Lower skilled operators may merely press a switch on a woodworking machine and monitor the automatic operation whereas more highly skilled operators set up equipment, cut and shape wooden parts, and verify dimensions using a template, caliper, or rule.

The next step in the manufacturing process is the production of subassemblies using fasteners and adhesives. The pieces then are brought together to form a complete unit. The product is then finished sanded, stained, and, if necessary, coated with a sealer, such as lacquer or varnish. Woodworkers may perform this work in teams or be assisted by a helper.

Woodworkers have been greatly affected by the introduction of computer-controlled machinery. This technology has raised worker productivity by allowing one operator to simultaneously tend a greater number of machines. With computerized numerical controls (CNC), an operator can program a machine to perform a sequence of operations automatically, resulting in greater precision and reliability. The integration of computers with equipment has improved production speeds and capabilities, simplified setup and maintenance requirements, and increased the demand for workers with computer skills.

While this costly equipment has had a great impact on workers in the largest, most efficient firms, precision or custom woodworkers—who generally work in smaller firms—have continued to employ the same production techniques they have used for many years. Workers such as **cabinetmakers and bench carpenters; model makers and patternmakers; and furniture finishers** work on a customized basis, often building one-of-a-kind items. These highly skilled