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## Woodworkers

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(O\*NET 51-7011.00, 51-7021.00, 51-7031.00, 51-7032.00, 51-7041.00, 51-7042.00, 51-7099.99)

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### 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 several years of experience.
- Job prospects will be best for highly skilled woodworkers who produce customized work, which is less susceptible to automation and import competition, and for those who can operate computerized numerical control machines.
- Employment is highly sensitive to economic cycles; during economic downturns, workers are subject to layoffs or reductions in hours.

### Nature of the Work

Despite the abundance of plastics and other materials, wood products continue to be useful and popular. Woodworkers help to meet the demand for wood products by creating finished products from lumber. Many of these products are mass produced, such as many types of furniture, kitchen cabinets, and musical instruments. Other products are crafted in small shops that make architectural woodwork, handmade furniture, and other specialty items.

Although the term woodworker often evokes images of a craftsman who builds ornate furniture using hand tools, the modern wood industry is highly technical. Some woodworkers still build by hand, but more often, handtools have been replaced by power tools, and much of the work has been automated. Work is usually done on an assembly line, meaning that most individuals learn to perform a single part of a complex process. Different types of woodworkers are employed in every stage of the building process, from sawmill to finished product. Their activities vary greatly.

Many woodworkers use computerized numerical control (CNC) machines to operate factory tools. Using these machines, woodworkers can create complex designs with fewer human steps. This technology has raised worker productivity by allowing one operator to simultaneously tend a greater number of machines. The integration of computers with equipment has improved production speed and capability, simplified setup and maintenance requirements, and increased the demand for workers with computer skills.

Production woodworkers set up, operate, and tend all types of woodworking machines. In sawmills, *sawing machine operators and tenders* set up, operate, or tend wood-sawing machines that cut logs into planks, timbers, or boards. In manufacturing plants, woodworkers first determine the best method of shaping and assembling parts, working 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 us-

ing handtools such as planes, chisels, wood files, or sanders to ensure a tight fit.

*Woodworking machine operators and tenders* set up, operate, or tend specific woodworking machines, such as drill presses, lathes, shapers, routers, sanders, planers, and wood-nailing machines. New operators may simply press a switch on a woodworking machine and monitor the automatic operation, but more highly skilled operators set up the equipment, cut and shape wooden parts, and verify dimensions using a template, caliper, or rule.

After wood parts are made, woodworkers add fasteners and adhesives and connect the pieces to form a complete unit. The product is then finish-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 helpers.

Precision or custom woodworkers, such as *cabinetmakers and bench carpenters, modelmakers and patternmakers, and furniture finishers*, often build one-of-a-kind items. These highly skilled precision woodworkers usually perform a complete cycle of tasks—cutting, shaping, and preparing surfaces and assembling complex wood components into a finished wood product. Precision workers normally need substantial training and an ability to work from detailed instructions and specifications. In addition, they often are required to exercise independent judgment when undertaking an assignment. They may still use heavy machinery and power tools in their everyday work. As CNC machines have become less expensive, many smaller firms have started using them.

**Work environment.** Working conditions vary by industry and specific job duties. In logging and sawmills, for example, workers handle heavy, bulky material and often encounter excessive noise, dust, and other air pollutants. However, the use of earplugs and respirators may alleviate these problems. Safety precautions and computer-controlled equipment minimize risk of injury from rough wood stock, sharp tools, and power equipment.

In furniture and kitchen cabinet manufacturing, employees who operate machinery also must wear ear and eye protection. They follow operating safety instructions and use safety shields or guards to prevent accidents. Those who work in areas where wood is cut or finishings applied often must wear an appropriate dust or vapor mask or a complete protective safety suit. Prolonged standing, lifting, and fitting of heavy objects are common characteristics of the job.



Woodworkers use sophisticated equipment to make wood into furniture.

## Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-16	
				Number	Percent
Woodworkers .....	51-7000	370,000	380,000	11,000	3
Cabinetmakers and bench carpenters .....	51-7011	149,000	153,000	4,100	3
Furniture finishers .....	51-7021	31,000	30,000	-1,000	-3
Model makers and patternmakers, wood .....	51-7030	4,200	2,500	-1,700	-40
Model makers, wood .....	51-7031	1,900	1,100	-800	-41
Patternmakers, wood .....	51-7032	2,300	1,400	-900	-40
Woodworking machine setters, operators, and tenders .....	51-7040	165,000	173,000	8,800	5
Sawing machine setters, operators, and tenders, wood .....	51-7041	65,000	68,000	2,500	4
Woodworking machine setters, operators, and tenders, except sawing .....	51-7042	100,000	106,000	6,400	6
Woodworkers, all other .....	51-7099	20,000	21,000	300	2

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

### Training, Other Qualifications, and Advancement

Many woodworkers are highly skilled and require significant on-the-job training. Mathematics skills, especially geometry, are essential and computer skills are increasingly important.

**Education and training.** Employers seek applicants with a high school diploma or the equivalent because of the growing sophistication of machinery and the constant need for retraining. People seeking woodworking jobs can enhance their employment and advancement prospects by completing high school and receiving training in mathematics, science, and computer applications.

Woodworkers increasingly acquire skills through higher education. For many workers, this means earning a degree from a vocational or trade school. Others may attend colleges or universities that offer training in wood technology, furniture manufacturing, wood engineering, and production management. These programs prepare students for positions in production, supervision, engineering, and management and are increasingly important as woodworking technology advances.

Most woodworkers are trained on the job, however, picking up skills informally from experienced workers. They can learn basic machine operations and job tasks in a few months, but becoming a skilled woodworker often requires 2 or more years.

Beginners usually observe and help experienced machine operators. They may supply material to, or remove fabricated products from, machines. Trainees also do simple machine operating jobs while closely supervised by experienced workers. As beginners gain experience, they perform more complex jobs with less supervision. Some may learn to read blueprints, set up machines, and plan the sequence of the work.

**Other qualifications.** In addition to training, woodworkers need mechanical ability, manual dexterity, and the ability to pay attention to detail and safety. As the industry becomes more sophisticated, skill with computers and computer-controlled machinery is becoming more important.

**Advancement.** Advancement opportunities are often limited and depend on education and training, seniority, and a worker's skills and initiative. Sometimes experienced woodworkers become inspectors or supervisors responsible for the work of a group of woodworkers. Production workers can advance into these positions by assuming additional responsibilities and at-

tending workshops, seminars, or college programs. Those who are highly skilled may set up their own woodworking shops.

### Employment

Woodworkers held about 370,000 jobs in 2006. Self-employed woodworkers, mostly cabinetmakers and furniture finishers, accounted for 12 percent of these jobs.

Three out of 4 woodworkers were employed in manufacturing. About 2 out of 5 worked in establishments manufacturing household and office furniture and fixtures, and 1 in 3 worked in wood product manufacturing, producing a variety of raw, intermediate, and finished woodstock. Wholesale and retail lumber dealers, furniture stores, reupholstery and furniture repair shops, and construction firms also employ woodworkers.

Woodworking jobs are found throughout the country. However, lumber and wood products-related production jobs are concentrated in the Southeast, Midwest, and Northwest, close to the supply of wood. Furniture-making jobs are more prevalent in the Southeast. Custom shops can be found everywhere, but generally are concentrated in or near highly populated areas.

### Job Outlook

Overall employment of woodworkers is expected to grow slower than average. Opportunities should be good for skilled applicants.

**Employment change.** Overall employment of woodworkers is expected to grow by 3 percent during the 2006-16 decade, which is slower than the average of all occupations. This slow growth will be a result of increased automation in the wood products manufacturing industry. Technology is becoming increasingly important to this industry, and automation has greatly reduced the number of people required to produce a finished product. Furthermore, international competition—especially from China—has led to a significant decline in domestic employment of these workers.

Employment of sawing and woodworking machine setters, operators, and tenders is expected to grow more slowly than the average through 2016. Import growth will lead to job losses in the U.S. industry. To remain competitive, some domestic firms are expected to move their production processes to foreign countries, further reducing employment. Firms that stay are increasingly using advanced technology, such as robots and

CNC machinery. These developments will prevent employment from rising with the demand for wood products, particularly in the mills and manufacturing plants where many processes can be automated.

Employment of furniture finishers is expected to decline slowly. Since furniture is largely mass-produced, it is highly susceptible to import competition; the percentage of imported furniture sold in the United States has steadily increased over the years, a trend that is expected to continue. Labor is significantly less expensive in developing countries, so these forces will likely affect the industry for quite some time.

Employment of bench carpenters and cabinetmakers is expected to grow more slowly than average, while modelmakers and patternmakers are expected to decline rapidly. Other specialized woodworking occupations will experience little or now change in growth. Demand for these workers will stem from increases in population, personal income, and business expenditures and from the continuing need for repair and renovation of residential and commercial properties. Therefore, opportunities should be available for workers who specialize in items such as moldings, cabinets, stairs, and windows. Firms that focus on custom woodwork will be best able to compete against imports without transferring jobs offshore.

**Job prospects.** Despite slower than average employment growth, prospects should be good for qualified workers. Many experienced woodworkers will soon reach retirement age, and this will create a need for new workers. In general, opportunities for more highly skilled woodworkers will be better than for woodworkers in specialties susceptible to automation and competition from imported wood products. The need for woodworkers with technical skills to operate their increasingly advanced computerized machinery will be especially great. Custom workers and modelmakers and patternmakers who know how to create and execute designs on a computer may have the best opportunities. These jobs require an understanding of wood and a strong understanding of computers—a combination that can be somewhat difficult to find.

The number of new workers entering these occupations has declined greatly in recent years, as training programs become less available or popular. Competition for jobs is expected to be mild, and opportunities should be best for woodworkers who,

through vocational education or experience, develop highly specialized woodworking skills or knowledge of CNC machine tool operation.

Employment in all woodworking specialties is highly sensitive to economic cycles. During economic downturns, workers are subject to layoffs or reductions in hours.

### Earnings

Median annual wage-and-salary earnings of cabinetmakers and bench carpenters were \$27,010 in May 2006. The middle 50 percent earned between \$21,350 and \$34,290. The lowest 10 percent earned less than \$17,660, and the highest 10 percent earned more than \$43,060.

Median annual wage-and-salary earnings of sawing machine setters, operators, and tenders, wood were \$24,280. The middle 50 percent earned between \$19,620 and \$29,930. The lowest 10 percent earned less than \$16,290, and the highest 10 percent earned more than \$36,220.

Median annual wage-and-salary earnings of woodworking machine setters, operators, and tenders, except sawing were \$23,940. The middle 50 percent earned between \$19,460 and \$29,480. The lowest 10 percent earned less than \$16,410, and the highest 10 percent earned more than \$35,950.

Median annual wage-and-salary earnings were \$25,010 for furniture finishers and \$22,580 for all other woodworkers.

### Related Occupations

Like woodworkers, carpenters also work with wood. In addition, many woodworkers follow blueprints and drawings and use machines to shape and form raw wood into a final product. Workers who perform similar functions working with other materials include sheet metal workers; structural and reinforcing iron and metal workers; computer control programmers and operators; machinists; textile, apparel, and furnishings occupations; and tool and die makers.

### Sources of Additional Information

For information about careers and education and training programs in woodworking, contact:

► WoodLINKS USA, P.O. Box 1153, Point Roberts, WA 98281.

Internet: <http://www.woodlinks.com/USA/home.html>