
Millwrights

(0*NET 49-9044.00)

Significant Points

- Training through apprenticeship programs, or through community colleges coupled with on-the-job training, generally lasts 4 years.
- Despite projected slower-than-average employment growth, skilled applicants should have good job opportunities.
- About 6 in 10 millwrights belong to labor unions, one of the highest rates of membership in the economy.

Nature of the Work

Millwrights install, repair, replace, and dismantle the machinery and heavy equipment used in many industries. The wide range of facilities and the development of new technology require millwrights to continually update their skills—from blueprint reading and pouring concrete to diagnosing and solving mechanical problems.

The millwright's responsibilities begin when machinery arrives at the jobsite. New equipment must be unloaded, inspected, and moved into position. To lift and move light machinery, millwrights use rigging and hoisting devices, such as pulleys and cables. With heavier equipment, they may require the assistance of hydraulic lift-truck or crane operators to position the machinery. Because millwrights often decide which device to use for moving machinery, they must know the load-bearing properties of rope, cables, hoists, and cranes.

Millwrights consult with production managers and others to determine the optimal placement of machines in a plant. When this placement requires building a new foundation, millwrights either prepare the foundation themselves or supervise its construction. As a result, they must know how to read blueprints and work with a variety of building materials.

To assemble machinery, millwrights fit bearings, align gears and wheels, attach motors, and connect belts, according to the manufacturer's blueprints and drawings. Precision leveling and alignment are important in the assembly process, so millwrights measure angles, material thickness, and small distances with tools such as squares, calipers, and micrometers. When a high level of precision is required, devices such as lasers and ultrasonic measuring tools may be used. Millwrights also work with hand and power tools, such as cutting torches, welding machines, and soldering guns, and with metalworking equipment, including lathes and grinding machines.

In addition to installing and dismantling machinery, many millwrights work with mechanics and maintenance workers to repair and maintain equipment. This includes preventive maintenance, such as lubrication and fixing or replacing worn parts. (For further information on machinery maintenance, see the statement on industrial machinery installation, repair, and maintenance workers, except millwrights, elsewhere in the *Handbook*.)

Increasingly sophisticated automation means more complicated machines for millwrights to install and maintain. For example, millwrights may install and maintain numerical control equipment—computer-controlled machine tools that fabricate manufacturing parts. This machinery requires special care and knowledge, so millwrights often work closely with computer or electronics experts, electricians, engineers, and manufacturers' representatives to install it. (Statements on electrical and electronics installers and repairers, as well as electricians, appear elsewhere in the *Handbook*.)

Working Conditions

Working conditions vary by industry. Millwrights employed in manufacturing often work in a typical shop setting and use protective equipment to avoid common hazards. For example, protective devices, such as safety belts, protective glasses, and hardhats may be worn to prevent injuries from falling objects or machinery. Those employed in construction may work outdoors in difficult weather conditions.

Millwrights work independently or as part of a team. Their tasks must be performed quickly and precisely, because disabled machinery costs a company time and money. Many millwrights work overtime; about 1 in 3 full-time millwrights report working more than 40 hours during a typical week. During power outages or other emergencies, millwrights are often assigned overtime and shift work.

Employment

Millwrights held about 69,000 jobs in 2002. Most work in manufacturing, primarily in durable goods industries, such as motor vehicle and parts manufacturing and iron and steel mills. About 36 percent of all millwrights are employed in construction, where most work for contracting firms. Although millwrights work in every State, employment is concentrated in heavily industrialized areas.

Training, Other Qualifications, and Advancement

Millwrights normally receive training for 4 years, through apprenticeship programs that combine on-the-job training with classroom



Most millwrights who work with complicated machinery need mechanical aptitude.

instruction or through community college coupled with informal on-the-job training. These programs include training in dismantling, moving, erecting, and repairing machinery. Trainees also may work with concrete and receive instruction in related skills, such as carpentry, welding, and sheet-metal work. Classroom instruction is provided in mathematics, blueprint reading, hydraulics, electricity, computers, and electronics.

Employers prefer applicants with a high school diploma or equivalency and some vocational training or experience. Courses in science, mathematics, mechanical drawing, computers, and machine shop practice are useful. Millwrights are expected to keep their skills up-to-date and may need additional training on technological advances, such as laser shaft alignment and vibration analysis.

Because millwrights assemble and disassemble complicated machinery, mechanical aptitude is very important. Strength and agility also are necessary for lifting and climbing. Millwrights need good interpersonal and communication skills to work as part of a team and to effectively give detailed instructions to others.

Advancement for millwrights usually takes the form of higher wages. Some advance to the position of supervisor or superintendent, while others may become self-employed contractors.

Job Outlook

Employment of millwrights is projected to grow more slowly than the average for all occupations through the year 2012. Because millwrights will be needed to maintain and repair existing machinery, dismantle old machinery, and install new equipment, skilled applicants should have good job opportunities. Prospects will be best for millwrights with training in installing new production technologies. In addition to employment growth, many job openings for these workers will stem from the need to replace experienced millwrights who transfer to other occupations or retire.

Employment of millwrights has historically been cyclical, rising and falling in line with investments in automation in the Nation's factories and production facilities. To remain competitive in coming years, firms will continue to require the services of millwrights to dismantle old equipment and install new machinery. Employment growth from new automation will be dampened somewhat by foreign competition and the introduction of new technologies, such as hydraulic torque wrenches, ultrasonic measuring tools, and laser shaft alignment, which allow fewer millwrights to perform more work. In addition, the demand for millwrights may be adversely affected as lower paid workers, such as electronics technicians and industrial machinery mechanics and maintenance workers, assume some installation and maintenance duties.

Earnings

Median hourly earnings of millwrights were \$20.19 in 2002. The middle 50 percent earned between \$15.77 and \$25.48. The lowest 10 percent earned less than \$12.39, and the highest 10 percent earned more than \$29.49. Earnings vary by industry and geographic location. Median hourly earnings in the industries employing the largest numbers of millwrights in 2002 are shown below.

Motor vehicle parts manufacturing	\$28.14
Building equipment contractors	19.33
Nonresidential building construction	18.98

About 60 percent of millwrights belong to labor unions, one of the highest rates of membership in the economy.

Related Occupations

To set up machinery for use in a plant, millwrights must know how to use hoisting devices and how to assemble, disassemble, and sometimes repair machinery. Other workers with similar job duties include industrial machinery installation, repair, and maintenance workers, except millwrights; aircraft and avionics equipment mechanics and service technicians; structural and reinforcing iron and metal workers; assemblers and fabricators; and heavy vehicle and mobile equipment service technicians and mechanics.

Sources of Additional Information

For further information on apprenticeship programs, write to the Apprenticeship Council of your State's labor department, local offices of your State employment service, or local firms that employ millwrights. In addition, you may contact:

- ▶ United Brotherhood of Carpenters and Joiners of America, 101 Constitution Ave. NW., Washington DC 20001. Internet: <http://www.carpenters.org>
- ▶ Associated General Contractors of America, 333 John Carlyle St., Suite 200, Alexandria, VA 22314. Internet: <http://www.agc.org>
- ▶ National Tooling and Machining Association, 9300 Livingston Rd., Fort Washington, MD 20744. Internet: <http://www.ntma.org>