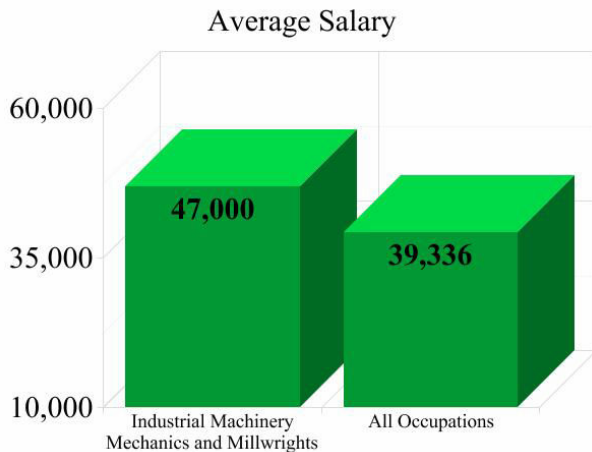


Industrial Machinery Mechanics and Millwrights

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WHAT THEY DO

Imagine an automobile assembly line: a large conveyor system moves unfinished automobiles down the line, giant robotic welding arms bond the different body panels together, hydraulic lifts move the motor into the body of the car, and giant presses stamp body parts from flat sheets of steel. All these complex machines need workers to install them and service them to make sure they function properly. Assembling and setting up these machines on the factory floor is the job of millwrights, while industrial machinery mechanics and machinery maintenance workers maintain and repair these machines.



Millwrights are the highly skilled workers who install, assemble, and, when necessary, dismantle machinery in factories, power plants, and construction sites. These workers consult with engineers and managers to determine the best location to place a machine. Millwrights then transport the machine parts to the desired location, using fork lifts, hoists, winches, cranes and other equipment. Machines do not arrive in one piece, and millwrights need to assemble them from their component parts. Millwrights must understand how a machine functions to assemble and disassemble it properly; this may involve knowledge of electronics, pneumatics, and computer systems. They use complex instruction books that detail the assembly of the machinery and use tools such as levels, welding machines, and hydraulic torque wrenches. Millwrights use micrometers, precision measuring devices, to achieve the extreme tolerances required by modern machines. On large projects, the use of cranes and trucks is common.

Assembly of a machine can take a few days or several weeks. Aside from assembly, millwrights are also involved in major repairs and disassembly of machines. If a manufacturing plant needs to clear floor space for new machinery, it can sell or trade-in old equipment. The breaking down of a machine is normally just as complicated as assembling it; all parts must be carefully taken apart, categorized and packaged for shipping.

While major repairs may require the assistance of a millwright, keeping machines in good working order is the primary responsibility of industrial machinery mechanics, also called industrial machinery repairers or maintenance machinists. To do this effectively, these workers must be able to detect minor problems and correct them before they become larger problems. Machinery mechanics use technical manuals, their understanding of the equipment, and careful observation to discover the cause of the problem. For example, after hearing a vibration from a machine, the mechanic must decide whether it is due to worn belts, weak motor bearings, or some other problem. Mechanics often need years of training and experience to fully diagnose all problems, but computerized diagnostic systems and vibration analysis techniques provide aid in determining the nature of the problem.

After diagnosing the problem, the industrial machinery mechanic may disassemble the equipment to repair or replace the necessary parts. Increasingly, mechanics are expected to have the electrical, electronics, and computer programming skills to repair sophisticated equipment on their own. Once a repair is made, mechanics perform tests to ensure that the machine is running smoothly. Primary responsibilities of industrial machinery mechanics also include preventive maintenance; for example, they adjust and calibrate automated manufacturing equipment, such as industrial robots.

EDUCATION REQUIRED

All machinery maintenance and millwright worker positions generally require a high school diploma, GED, or its equivalent. However, employers increasingly prefer to hire machinery maintenance workers with some training in industrial technology. Employers also prefer to hire those who have taken high school or postsecondary courses in mechanical drawing, mathematics, blueprint reading, computer programming, or electronics.

Most millwrights, and some industrial machinery mechanics, enter the occupation through an apprenticeship program that typically lasts about 4 years. Apprenticeships can be sponsored by local union chapters, employers, or the State labor department. Training in these apprenticeships involves a combination of on-the-job training and classroom learning. Jobseekers can apply for union apprenticeships, and qualified applicants may begin training in local training facilities and factories.

Industrial machinery mechanics usually need a year or more of formal education and training after high school to learn the growing range of mechanical and technical skills that they need. While mechanics used to specialize in one area, such as hydraulics or electronics, many factories now require every mechanic to have knowledge of electricity, electronics, hydraulics, and computer programming.

Industrial Machinery Mechanics & Millrights - Continued

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OTHER USEFUL SKILLS

Machinery mechanics must have good problem-solving abilities, as it is important for them to be able to discover the cause of a problem to repair it. Mechanical aptitude and manual dexterity are also important. Good reading comprehension is necessary to understand the technical manuals of a wide range of machines; and good communications skills are also essential in order for millwrights, mechanics and maintenance workers to understand the needs of other workers and managers. In addition, good physical conditioning and agility are necessary because repairers sometimes have to lift heavy objects or climb to reach equipment.

HOW TO ADVANCE

Opportunities for advancement vary by specialty. Machinery maintenance workers, if they take classes and gain additional skills, may advance to industrial machinery mechanic or supervisor. Industrial machinery mechanics also advance by working with more complicated equipment and gaining additional repair skills. The most highly skilled repairers can be promoted to supervisor, master mechanic, or millwright. Experienced millwrights can advance into team leading roles.

WORK ENVIRONMENT

In production facilities, these workers are subject to common shop injuries such as cuts, bruises, and strains. In the construction setting, workers must be careful of heavy equipment. They also may work in awkward positions, including on top of ladders or in cramped conditions under large machinery, which exposes them to additional hazards. To avoid injuries, workers must follow safety precautions and use protective equipment, such as hardhats, safety glasses, steel-tipped shoes, hearing protectors, and belts.

Because factories and other facilities cannot afford to have industrial machinery out of service for long periods, mechanics may be on call or assigned to work nights or on weekends. Overtime is common among these occupations, as about 30 percent of employees worked over 40 hours per week, on average, in 2008.

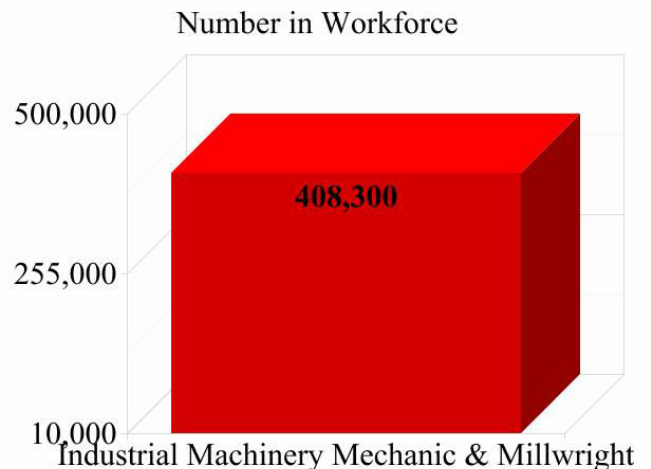
Millwrights are typically employed on a contract basis and may only spend a few days or weeks at a single site. As a result, schedules of work can be unpredictable, and workers may experience down time in between jobs.

JOB GROWTH

Employment of industrial machinery mechanics and millwrights is expected to grow 6 percent from 2008 to 2018, more slowly than the average for all occupations. The increased use of machinery in manufacturing will require more millwrights to install this equipment and more mechanics and maintenance workers to keep it in good working order.

Employment of millwrights is expected to grow 1 percent from 2008 to 2018, the equivalent of little or no change. The demand for millwrights is driven by the purchasing of machinery in the construction and manufacturing industries. Cost-cutting pressures will drive manufacturers to further automate production and increase machinery presence on the factory floor. The growth of the power industry will also generate work for millwrights, as they install and repair turbines on wind mills, coal plants, and hydroelectric dams.

Employment of industrial machinery mechanics and maintenance workers is expected to grow 7 percent from 2008 to 2018, which is slower than average. As factories become increasingly automated, these workers will be needed to maintain and repair the automated equipment. However, many new computer-controlled machines are capable of diagnosing problems quickly, resulting in faster and easier repair, which somewhat slows the growth of these occupations.



Applicants with broad skills in machine repair and maintenance should have favorable job prospects. In addition to job openings from growth, there will be a need to replace the many older workers who are expected to retire, and those who leave the occupation for other reasons. Some employers have reported difficulty in recruiting young workers with the necessary skills.