

### Earnings

Median hourly earnings of cabinetmakers and bench carpenters were \$10.83 in 2000. The middle 50 percent earned between \$8.69 and \$13.72. The lowest 10 percent earned less than \$7.24, and the highest 10 percent earned more than \$17.21. Median hourly earnings in the industries employing the largest numbers of cabinetmakers and bench carpenters in 2000 are shown below:

Partitions and fixtures .....	\$12.24
Furniture and homefurnishings stores .....	11.15
Millwork, plywood, and structural members .....	10.75
Household furniture .....	9.83

Median hourly earnings of sawing machine setters, operators, and tenders, wood were \$10.23 in 2000. The middle 50 percent earned between \$8.40 and \$12.60. The lowest 10 percent earned less than \$7.12, and the highest 10 percent earned more than \$15.36. Median hourly earnings in the industries employing the largest numbers of sawing machine setters, operators, and tenders, wood in 2000 are shown below:

Sawmills and planing mills .....	\$10.56
Millwork, plywood, and structural members .....	10.36
Household furniture .....	9.88

Median hourly earnings of woodworking machine setters, operators, and tenders, except sawing were \$10.00 in 2000. The middle 50 percent earned between \$8.19 and \$12.32. The lowest 10 percent earned less than \$6.95, and the highest 10 percent earned more than \$14.88. Median hourly earnings in the industries employing

the largest numbers of woodworking machine setters, operators, and tenders, except sawing in 2000 are shown below:

Millwork, plywood, and structural members .....	\$10.36
Household furniture .....	10.05
Sawmills and planing mills .....	9.83
Miscellaneous wood products .....	9.37
Wood containers .....	8.30

In 2000, median hourly earnings were \$10.34 for furniture finishers and \$9.48 for all other woodworkers.

Some woodworkers, such as those in logging or sawmills who are engaged in processing primary wood and building materials, are members of the International Association of Machinists. Others belong to the United Brotherhood of Carpenters and Joiners of America.

### Related Occupations

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, and tool and die makers.

### Sources of Additional Information

For information about woodworking occupations, contact local furniture manufacturers, sawmills and planing mills, cabinetmaking or millwork firms, lumber dealers, a local office of one of the unions mentioned above, or the nearest office of the State employment service.

## Other Production Occupations

### Dental Laboratory Technicians

(O\*NET 51-9081.00)

#### Significant Points

- Employment should increase slowly, as the public's improving dental health requires fewer dentures but more bridges and crowns.
- Dental laboratory technicians need artistic aptitude for detailed and precise work, a high degree of manual dexterity, and good vision.

#### Nature of the Work

Dental laboratory technicians fill prescriptions from dentists for crowns, bridges, dentures, and other dental prosthetics. First, dentists send a specification of the item to be fabricated, along with an impression (mold) of the patient's mouth or teeth. Then, dental laboratory technicians, also called dental technicians, create a model of the patient's mouth by pouring plaster into the impression and allowing it to set. Next, they place the model on an apparatus that mimics the bite and movement of the patient's jaw. The model serves as the basis of the prosthetic device. Technicians examine the model, noting the size and shape of the adjacent teeth, as well as gaps within the gumline. Based upon these observations and the dentist's specifications, technicians build and shape a wax tooth or teeth model, using small hand instruments called wax spatulas and wax carvers. They use this wax model to cast the metal framework for the prosthetic device.

After the wax tooth has been formed, dental technicians pour the cast and form the metal and, using small hand-held tools, prepare the surface to allow the metal and porcelain to bond. They then apply porcelain in layers, to arrive at the precise shape and color of a tooth. Technicians place the tooth in a porcelain furnace to bake the porcelain onto the metal framework, and then adjust the shape and color, with subsequent grinding and addition of porcelain to achieve a sealed finish. The final product is a nearly exact replica of the lost tooth or teeth.

In some laboratories, technicians perform all stages of the work, whereas in other labs, each technician does only a few. Dental laboratory technicians can specialize in one of five areas: Orthodontic appliances, crowns and bridges, complete dentures, partial dentures, or ceramics. Job titles can reflect specialization in these areas. For example, technicians who make porcelain and acrylic restorations are called *dental ceramists*.

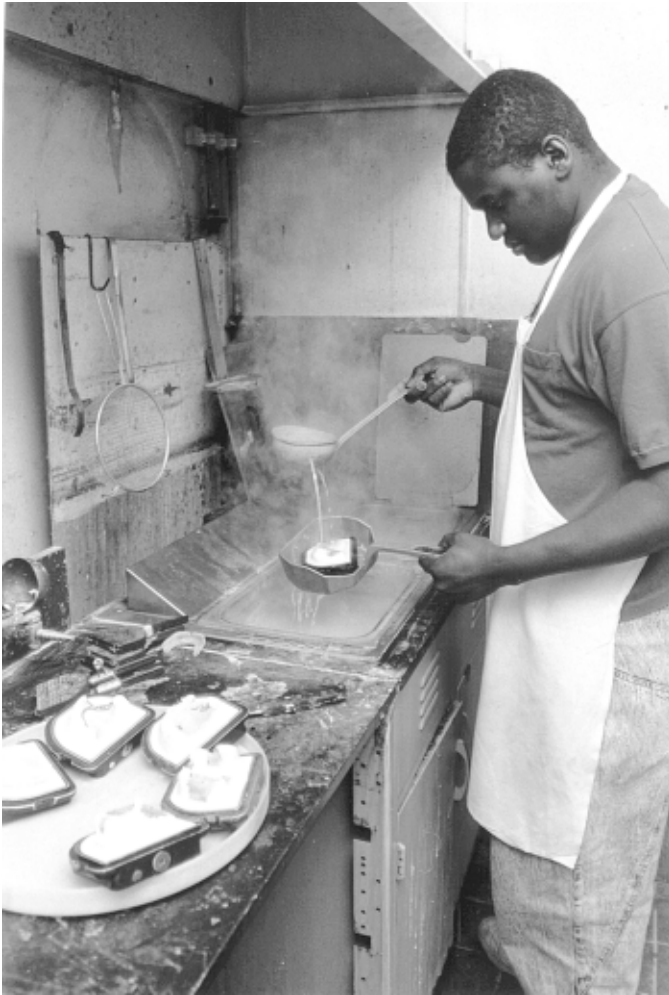
#### Working Conditions

Dental laboratory technicians generally work in clean, well-lit, and well-ventilated areas. Technicians usually have their own workbenches, which can be equipped with Bunsen burners, grinding and polishing equipment, and hand instruments, such as wax spatulas and wax carvers.

The work is extremely delicate and time consuming. Salaried technicians usually work 40 hours a week, but self-employed technicians frequently work longer hours.

#### Employment

Dental laboratory technicians held about 43,000 jobs in 2000. Most jobs were in commercial dental laboratories, which usually are



*Dental laboratory technicians use molds of patients' teeth to design crowns, bridges, dentures, and other dental prosthetics.*

small, privately owned businesses with fewer than five employees. However, some laboratories are large; a few employ more than 50 technicians.

Some dental laboratory technicians work in dentists' offices. Others work for hospitals providing dental services, including U.S. Department of Veterans Affairs' hospitals. Some technicians work in dental laboratories in their homes, in addition to their regular job.

### **Training, Other Qualifications, and Advancement**

Most dental laboratory technicians learn their craft on the job. They begin with simple tasks, such as pouring plaster into an impression, and progress to more complex procedures, such as making porcelain crowns and bridges. Becoming a fully trained technician requires an average of 3 to 4 years, depending upon the individual's aptitude and ambition, but it may take a few years more to become an accomplished technician.

Training in dental laboratory technology also is available through community and junior colleges, vocational-technical institutes, and the Armed Forces. Formal training programs vary greatly both in length and in the level of skill they impart.

In 2000, 30 programs in dental laboratory technology were approved (accredited) by the Commission on Dental Accreditation in conjunction with the American Dental Association (ADA). These programs provide classroom instruction in dental materials science,

oral anatomy, fabrication procedures, ethics, and related subjects. In addition, each student is given supervised practical experience in a school or an associated dental laboratory. Accredited programs normally take 2 years to complete and lead to an associate degree.

Graduates of 2-year training programs need additional hands-on experience to become fully qualified. Each dental laboratory owner operates in a different way, and classroom instruction does not necessarily expose students to techniques and procedures favored by individual laboratory owners. Students who have taken enough courses to learn the basics of the craft usually are considered good candidates for training, regardless of whether they have completed a formal program. Many employers will train someone without any classroom experience.

The National Board for Certification, an independent board established by the National Association of Dental Laboratories, offers certification in dental laboratory technology. Certification, which is voluntary, can be obtained in five specialty areas: crowns and bridges, ceramics, partial dentures, complete dentures, and orthodontic appliances.

In large dental laboratories, technicians may become supervisors or managers. Experienced technicians may teach or may take jobs with dental suppliers in such areas as product development, marketing, and sales. Still, for most technicians, opening one's own laboratory is the way toward advancement and higher earnings.

A high degree of manual dexterity, good vision, and the ability to recognize very fine color shadings and variations in shape are necessary. An artistic aptitude for detailed and precise work also is important. High school students interested in becoming dental laboratory technicians should take courses in art, metal and wood shop, drafting, and sciences. Courses in management and business may help those wishing to operate their own laboratories.

### **Job Outlook**

Job opportunities for dental laboratory technicians should be favorable, despite very slow growth in the occupation. Employers have difficulty filling trainee positions, probably because entry-level salaries are relatively low and because the public is not familiar with the occupation.

Although job opportunities are favorable, slower-than-average growth in the employment of dental laboratory technicians is expected through the year 2010, due to changes in dental care. The overall dental health of the population has improved because of fluoridation of drinking water, which has reduced the incidence of dental cavities, and greater emphasis on preventive dental care since the early 1960s. As a result, full dentures will be less common, as most people will need only a bridge or crown. However, during the last few years, demand has arisen from an aging public that is growing increasingly interested in cosmetic prostheses. For example, many dental laboratories are filling orders for composite fillings that are the same shade of white as natural teeth to replace older, less attractive fillings.

### **Earnings**

Median hourly earnings of dental laboratory technicians were \$12.94 in 2000. The middle 50 percent earned between \$9.83 and \$16.82 an hour. The lowest 10 percent earned less than \$7.78, and the highest 10 percent earned more than \$21.47 an hour. Median hourly earnings of dental laboratory technicians in 2000 were \$12.88 in offices and clinics of dentists and \$12.87 in medical and dental laboratories.

Technicians in large laboratories tend to specialize in a few procedures, and, therefore, tend to be paid a lower wage than those employed in small laboratories that perform a variety of tasks.

### Related Occupations

Dental laboratory technicians fabricate artificial teeth, crowns and bridges, and orthodontic appliances, following specifications and instructions provided by dentists. Other workers who make and repair medical devices include dispensing opticians, ophthalmic laboratory technicians, orthotists and prosthetists, and precision instrument and equipment repairers.

### Sources of Additional Information

For a list of accredited programs in dental laboratory technology, contact:

► Commission on Dental Accreditation, American Dental Association, 211 E. Chicago Ave., Chicago, IL 60611. Internet: <http://www.ada.org>

For information on requirements for certification, contact:

► National Board for Certification in Dental Technology, 1530 Metropolitan Blvd., Tallahassee, FL 32308. Internet:

<http://www.nadl.org/html/certification.html>

For information on career opportunities in commercial laboratories, contact:

► National Association of Dental Laboratories, 1530 Metropolitan Blvd., Tallahassee, FL 32308. Internet: <http://www.nadl.org>

General information on grants and scholarships is available from dental technology schools.

## Inspectors, Testers, Sorters, Samplers, and Weighers

(O\*NET 51-9061.01, 51-9061.02, 51-9061.03, 51-9061.04, 51-9061.05)

### Significant Points

- For workers who perform relatively simple tests of products, a high school diploma is sufficient; experienced production workers fill more complex inspecting positions.
- Employment is expected to decline, reflecting the growth of automated inspection and the redistribution of quality-control responsibilities from inspectors to other production workers.

### Nature of the Work

Inspectors, testers, sorters, samplers, and weighers ensure that your food will not make you sick, your car will run properly, and your pants will not split the first time you wear them. These workers monitor or audit quality standards for virtually all manufactured products, including foods, textiles, clothing, glassware, motor vehicles, electronic components, computers, and structural steel. As quality becomes increasingly important to the success of many production firms, daily duties of inspectors have changed. In some cases, their titles also have changed to *quality-control inspector* or a similar name, reflecting the growing importance of quality. (A separate statement on construction and building inspectors appears elsewhere in the *Handbook*.)

Regardless of title, all inspectors, testers, sorters, samplers, and weighers work to guarantee the quality of the goods their firms produce. Job duties, even within one company, vary by the type of products produced or the stage of production. Specific job duties also vary across the wide range of industries in which these workers are found. For example, inspectors may check products by sight, sound, feel, smell, or even taste to locate imperfections such as cuts, scratches, bubbles, missing pieces, misweaves, or crooked

seams. These workers also may verify dimensions, color, weight, texture, strength, or other physical characteristics of objects. Machinery testers generally verify that parts fit, move correctly, and are properly lubricated; check the pressure of gases and the level of liquids; test the flow of electricity; and do a test run to check for proper operation. Some jobs involve only a quick visual inspection; others require a longer, detailed one. Sorters may separate goods according to length, size, fabric type, or color, while samplers test or inspect a sample taken from a batch or production run for malfunctions or defects. Weighers weigh quantities of materials for use in production.

Inspectors, testers, sorters, samplers, and weighers are involved at every stage of the production process. Some inspectors examine materials received from a supplier before sending them to the production line. Others inspect components, subassemblies, and assemblies or perform a final check on the finished product. Depending on the skill level of the inspectors, they also may set up and test equipment, calibrate precision instruments, repair defective products, or record data.

Inspectors, testers, sorters, samplers, and weighers rely on a number of tools to perform their jobs. Many use micrometers, calipers, alignment gauges, and other instruments to check and compare the dimensions of parts against the parts' specifications. They also may operate electronic equipment, such as measuring machines, which use sensitive probes to measure a part's dimensional accuracy. Inspectors testing electrical devices may use voltmeters, ammeters, and oscilloscopes to test insulation, current flow, and resistance.



An inspector collects grain samples for testing.