

during economic slowdowns, because maintaining and repairing jewelry is an ongoing process. In fact, demand for jewelry repair may increase during recessions, as people repair or restore existing pieces rather than purchase new ones. Also, many nontraditional vendors typically do not offer repair services.

Within manufacturing, increasing automation will adversely affect employment of low-skilled occupations, such as assembler and polisher. Automation will have a lesser impact on more creative, highly skilled positions, such as mold- and modelmaker. Furthermore, small manufacturers, which typify the industry, will have an increasingly difficult time competing with the larger manufacturers when it comes to supplying large retailers. Because of recent international trade agreements, exports are increasing modestly as manufacturers become more competitive in foreign markets. However, imports from foreign manufacturers are increasing more rapidly than exports due to these same agreements.

Earnings

Median annual earnings for jewelers and precious stone and metal workers were \$26,330 in 2000. The middle 50 percent earned between \$19,140 and \$35,150. The lowest 10 percent earned less than \$14,550, and the highest 10 percent earned more than \$44,120. In 2000, median annual earnings in the industries employing the largest numbers of jewelers and precious stone and metal workers were:

Miscellaneous shopping goods stores	\$32,290
Jewelry, silverware, and plated ware	22,920

Most jewelers start out with a base salary but, once they become more proficient, they might begin charging by the number of pieces completed. Jewelers who work in retail stores may earn a commission for each piece of jewelry sold, in addition to their base salary. Many jewelers also enjoy a variety of benefits, including reimbursement from their employers for work-related courses and discounts on jewelry purchases.

Related Occupations

Jewelers and precious stone and metal workers do precision handwork. Other skilled workers who do similar jobs include precision instrument and equipment repairers; welding, soldering, and brazing workers; and woodworkers. Some jewelers and precious stone and metal workers create their own jewelry designs. Other visually artistic occupations include artists and related workers, and designers. And, some jewelers and precious stone and metal workers are involved in the buying and selling of stones and metals or of the finished piece of jewelry. Similar occupations include retail salespersons and sales representatives in wholesale trade.

Sources of Additional Information

Information on job opportunities and training programs for jewelers is available from:

- Gemological Institute of America, 5345 Armada Dr., Carlsbad, CA 92008. Internet: <http://www.gia.org>
- California Institute of Jewelry Training, 5800 Winding Way, Carmichael, CA 95608. Internet: <http://www.jewelrytraining.com>

General career information is available from:

- Manufacturing Jewelers and Suppliers of America, 45 Royal Little Dr., Providence, RI 02904. Internet: <http://mjsa.polygon.net>

To receive a list of technical schools which have programs in jewelry design, accredited by the Accrediting Commission of Career Schools and Colleges of Technology, contact:

- Accrediting Commission of Career Schools and Colleges of Technology, 2101 Wilson Blvd., Suite 302, Arlington, VA 22201. Internet: <http://www.accsct.org>

Ophthalmic Laboratory Technicians

(O*NET 51-9083.01, 51-9083.02)

Significant Points

- Nearly all ophthalmic laboratory technicians learn their skills on the job.
- Increasing use of automated equipment will result in relatively slow job growth.
- Only a small number of job openings will be created each year because the occupation is small and slower-than-average growth is expected.

Nature of the Work

Ophthalmic laboratory technicians—also known as *manufacturing opticians*, *optical mechanics*, or *optical goods workers*—make prescription eyeglass or contact lenses. Prescription lenses are curved in such a way that light is correctly focused onto the retina of the patient's eye, improving vision. Some ophthalmic laboratory technicians manufacture lenses for other optical instruments, such as telescopes and binoculars. Ophthalmic laboratory technicians cut, grind, edge, and finish lenses according to specifications provided by dispensing opticians, optometrists, or ophthalmologists, and may insert lenses into frames to produce finished glasses. Although some



A contact lens manufacturing worker grinds lenses according to prescription.

lenses still are produced by hand, technicians increasingly use automated equipment to make lenses.

Ophthalmic laboratory technicians should not be confused with workers in other vision care occupations. Ophthalmologists and optometrists are “eye doctors” who examine eyes, diagnose and treat vision problems, and prescribe corrective lenses. Ophthalmologists are physicians who perform eye surgery. Dispensing opticians, who also may do work described here, help patients select frames and lenses, and adjust finished eyeglasses. (See the statement on physicians and surgeons, which includes ophthalmologists, as well as the statements on optometrists and opticians, dispensing, elsewhere in the *Handbook*.)

Ophthalmic laboratory technicians read prescription specifications, then select standard glass or plastic lens blanks and mark them to indicate where the curves specified on the prescription should be ground. They place the lens in the lens grinder, set the dials for the prescribed curvature, and start the machine. After a minute or so, the lens is ready to be “finished” by a machine that rotates it against a fine abrasive to grind it and smooth out rough edges. The lens is then placed in a polishing machine with an even finer abrasive, to polish it to a smooth, bright finish.

Next, the technician examines the lens through a lensometer, an instrument similar in shape to a microscope, to make sure the degree and placement of the curve is correct. The technician then cuts the lenses and bevels the edges to fit the frame, dips each lens into dye if the prescription calls for tinted or coated lenses, polishes the edges, and assembles the lenses and frame parts into a finished pair of glasses.

In small laboratories, technicians usually handle every phase of the operation. In large ones, technicians may be responsible for operating computerized equipment where virtually every phase of the operation is automated. Technicians also inspect the final product for quality and accuracy.

Working Conditions

Ophthalmic laboratory technicians work in relatively clean and well-lit laboratories and have limited contact with the public. Surroundings are relatively quiet despite the humming of machines. At times, technicians wear goggles to protect their eyes, and may spend a great deal of time standing.

Most ophthalmic laboratory technicians work a 5-day, 40-hour week, which may include weekends, evenings, or occasionally some overtime. Some work part time.

Ophthalmic laboratory technicians need to take precautions against the hazards associated with cutting glass, handling chemicals, and working near machinery.

Employment

Ophthalmic laboratory technicians held about 32,000 jobs in 2000. Thirty-one percent were in retail optical stores that manufacture and sell prescription glasses and contact lenses, and 23 percent were in optical laboratories. These laboratories manufacture eyewear and contact lenses for sale by retail stores, as well as by ophthalmologists and optometrists. Most of the rest were in wholesalers or in optical laboratories that manufacture lenses for other optical instruments, such as telescopes and binoculars.

Training, Other Qualifications, and Advancement

Nearly all ophthalmic laboratory technicians learn their skills on the job. Employers filling trainee jobs prefer applicants who are high school graduates. Courses in science, mathematics, and computers are valuable; manual dexterity and the ability to do precision work are essential.

Technician trainees producing lenses by hand start on simple tasks such as marking or blocking lenses for grinding, then progress to lens grinding, lens cutting, edging, beveling, and eyeglass assembly. Depending on individual aptitude, it may take up to 6 months to become proficient in all phases of the work.

Technicians using automated systems will find computer skills valuable. Training is completed on the job and varies in duration depending on the type of machinery and individual aptitude.

A very small number of ophthalmic laboratory technicians learn their trade in the Armed Forces or in the few programs in optical technology offered by vocational-technical institutes or trade schools. These programs have classes in optical theory, surfacing and lens finishing, and the reading and applying of prescriptions. Programs vary in length from 6 months to 1 year and award certificates or diplomas.

Ophthalmic laboratory technicians can become supervisors and managers. Some technicians become dispensing opticians, although further education or training generally is required.

Job Outlook

Overall employment of ophthalmic laboratory technicians is expected to grow more slowly than the average for all occupations through the year 2010. Employment is expected to increase slowly in manufacturing as firms invest in automated machinery.

Demographic trends make it likely that many more Americans will need vision care in the years ahead. Not only will the population grow, but also the proportion of middle-aged and older adults is projected to increase rapidly. Middle age is a time when many people use corrective lenses for the first time, and elderly persons usually require more vision care than others.

Fashion, too, influences demand. Frames come in a variety of styles and colors—encouraging people to buy more than one pair. Demand also is expected to grow in response to the availability of new technologies that improve the quality and look of corrective lenses, such as antireflective coatings and bifocal lenses without the line visible in traditional bifocals.

Most job openings will arise from the need to replace technicians who transfer to other occupations or leave the labor force. However, only a small number of job openings will be created each year because the occupation is small.

Earnings

Median hourly earnings of ophthalmic laboratory technicians were \$9.88 in 2000. The middle 50 percent earned between \$8.25 and \$12.07 an hour. The lowest 10 percent earned less than \$7.19, and the highest 10 percent earned more than \$14.71 an hour. In 2000, median hourly earnings of ophthalmic laboratory technicians were \$10.25 in ophthalmic goods manufacturing and \$9.79 in retail stores, not elsewhere classified, including optical goods stores.

Related Occupations

Workers in other precision production occupations include dental laboratory technicians, orthotists and prosthetists, and precision instrument and equipment repairers.

Sources of Additional Information

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

► Commission on Opticianry Accreditation, 7023 Little River Turnpike, Suite 207, Annandale, VA 22003. Internet: <http://www.coaccreditation.com>

State employment service offices can provide information about job openings for ophthalmic laboratory technicians.