

# Technical Illustrators



## Occupational Brief Title Codes:

- D.O.T.: 017.281-034
- G.O.E.: 05.03.02
- S.O.C.: 17-3013
- O\*NET™ 3.1: 17-3013.00
- N.A.I.C.S.: 511130, 541430, 31, 32, 33
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## Work Classification Based Related

### D.O.T. Occupations:

- Automotive Design Drafters
- Commercial Drafters
- Detail Drafters
- Furniture Detailers

## Interests Based Related

### G.O.E. Occupations:

- Cartographic Drafters
- Computer-Aided Design Technicians
- Patternmakers
- Tool Design Drafters

## Skills Based Related

### O\*NET Occupations:

- Civil Engineering Technicians
- Electrical Engineering Technicians
- Mechanical Engineers
- Model Makers, Metal and Plastic

## Noteworthy Quote:

*“Technical illustrators contribute greatly to comprehensibility of technical information, and the work is quite like having the best of two worlds. Having the opportunity to think technically and creatively on an assignment truly makes this work enjoyable. Our contributions to a project often go beyond just illustrating a concept. We frequently have the opportunity to influence the appearance and functionality of a product because we can provide alternate views.”*

**» Brian Follas, Technical Illustrator/Technical Writer, EXCOMEDIA, Inc., North Carolina**

*Technical illustrators* (ˈtech-ni-cal ˈil-lus-tra-tors) lay out and draw pictures and diagrams for sales literature, owner’s manuals, patents, and other instructional and technical material.

Almost every product sold, from a simple flashlight to a computer network, has instructions that come with it. Illustrations may show parts, assemblies, or groups of both. Instructions tell in words and pictures how to assemble, install, operate, use, maintain, and repair machines, tools, equipment, toys, appliances, automobiles, and thousands of other products.

Technical illustrators make the drawings that go with these instructions and the patents for the product. Unlike advertising design artists, who produce images that enhance and show products at their best, technical illustrators make realistic drawings. The drawings must look like the things being portrayed. The work must be exact, precise, and easy to understand. It must clarify and point out information in the accompanying text.

Illustrations are uniquely suited for presenting certain kinds of images that cannot be shown in photography. Diagrams, three-dimensional line drawings, oblique-angle views, and projections are necessary to show parts or the order in which things go together. Unlike photos, drawings do not have background or other details not directly related to the purpose of the images.

## Work Performed

Like other drafting professionals, to do their work, technical illustrators first learn about the product they will draw. They study blueprints, models, prototypes, and photos. They may visit a factory production line to see what goes into a product and how workers put it together. They ask questions about the product or



*Technical illustrators lay out and draw pictures and diagrams for sales literature and owner’s manuals.*

*Photo by Amy Elliott*

the idea for a product. They talk to engineers and others and confer with them over the first rough sketches. They put the ideas of engineers in drawings, which must be plain enough so that the users will understand them.

About 80 percent of a technical illustrator's work consists of three-dimensional line drawings. Drawings show the overall length, width, and depth of the objects, as well as separate views of component parts, such as gears, levers, and other interior units. Successive drawings show the relationships of parts. Illustrators may color or shade parts to point out details. Overlays may show the assembly of the object by stages. Illustrators may paste comments or instructions in place on the drawings.

Technical illustrators generally use a computer to make their illustrations. From information stored in the computer, they can produce images on the screen. They can rotate these images, magnify them, or view them from any angle. They can make changes or modify the images by keying data into the terminal. They can also print the images from the screen. When making drawings or illustrations by hand, they work at a lighted drafting table, using ink, crayons, airbrushes, and drafting tools such as ruler, T-square, and protractor.

Besides making drawings of parts already on the market or in production, illustrators may be asked to make drawings for an idea not yet fully developed. Industry or service firms may use these drawings or printouts in proposing a new product or process. Technical illustrators also produce charts, graphs, schematics, and diagrams for booklets and manuals.

Technical illustrators employed as staff in manufacturing plants produce drawings only for the products the company makes. Since technical illustrators for these suppliers work only on certain items, they become specialists. For instance, technical illustrators in aircraft plants produce drawings, sketches, blueprints, or drafts of airplane parts. Or they might set up a chart that shows the fuel used by a jet engine running at different speeds.

On the other hand, technical illustrators who work for service firms that print technical handbooks, instructions, charts, sketches, and drawings on assignment for other companies produce illustrations for all kinds of goods. The drawings must suit the methods of production or use. For instance, illustrators may make drawings for use in videotaped instructions or for use in layouts for offset printing. They may produce illustrations in the form of photo transparencies, computer printouts, or other media.

### **Working Conditions**

Technical illustrators work in a well-lighted work space. They spend much of their time at a computer or drafting table. However, many technical illustrators often go to other departments and confer with those who make, design, and test a product. Employers give technical illustrators the leeway that helps them be creative and do their best work.

Drafters who draw illustrations of a wide range of products enjoy variety in their work. Others, who may work on only one or two parts of a complex machine, may find the work monotonous at times.

### **Hours and Earnings**

As a rule, technical illustrators who work in industry or for technical publishers work a forty-hour week. Most work eight hours a day, five days a week. When a deadline is near, they may work overtime. For this, they get extra pay. Freelance technical illustrators may set their own hours and work by the job. Contracts for each job state the work to be performed, the fee for their services, as well as the deadline for completion. They too may put in extra hours when a deadline is near, but do not generally receive overtime pay.

Separate employment figures for technical illustrators are not available. However, this occupation is included in the larger group of mechanical drafters. Like other drafters, earnings for technical illustrators vary with their education, experience, responsibilities, and employer. According to the Bureau of Labor Statistics, in 2000, overall salaries for mechanical drafters ranged from around \$24,000 a year to about \$60,000 a year. Half earned between \$30,000 and \$50,000 a year, with an average wage of around \$40,000 a year.

Freelance illustrators do not earn a weekly salary. Their earnings, which depend on their skills and reputation, vary greatly. Freelancers with a steady clientele may earn as much as \$50,000 a year, sometimes more.

Salaried illustrators generally receive benefits such as paid holidays, sick leave, health insurance, or pensions. Self-employed illustrators must provide for their own benefits.

### **Education and Training**

Technical illustrators must have a high school diploma and further formal education in mechanical drawing and drafting, including computer-aided design. Many employers hire only applicants who have had two or more years of college.

In high school, those hoping to be technical illustrators should take courses in basic engineering technology, mechanical drawing, mathematics, physics, and art. Graphic arts and other basic computer-aided design courses will be extremely useful. Metal and wood shop courses will provide hands on experience with technical equipment and help students understand how they are used. Those interested in freelance work should also take business management courses.

After high school, students should enroll in a formal post-secondary program of study in applied arts and technical communication. Courses such as drafting, illustration, and graphic design help students learn the techniques and standards for all kinds of illustration. Skills

in computer-aided drafting and design are essential. Students should become skilled in the use of at least one software package for illustration.

Many types of publicly and privately operated schools, such as community and junior colleges and technical institutes, provide some form of drafting training. The kind and quality of programs vary, so prospective students should be careful when selecting a program. They should ask schools to provide information about the kinds of jobs obtained by graduates, the type of instructional equipment and programs available, and faculty qualifications. They should also contact prospective employers to find out their preferences.

In general, technical institutes offer intensive technical training. However, they offer less general education than junior and community colleges. Most of these schools award a certificate, diploma, or a 2-year associate degree based on completion of a certain number of course hours. Four-year colleges, on the other hand, usually do not offer drafting training, but a bachelor degree in engineering, architecture, or graphic design are useful for obtaining a job as a technical illustrator.

Overall, those interested in technical illustration should concentrate on the technical and conceptual skills necessary for producing brochures, manuals, and patents for industrial, manufacturing, or engineering fields. While in school, students usually build a portfolio of drawings representing their best work. They show this portfolio at job interviews.

### **Certification and Professional Societies**

Several organizations promote the interests of technical illustrators. Organizations like the American Design Drafting Association (ADDA) and the National Technical Services Association (NTSA) offer their members educational and networking opportunities. Many such groups also post job openings, and publish materials on technical advancements, research, and other industry news, including legislative concerns.

Other organizations include the International Society for Technical Illustrators, the Society for Technical Communication, the American Institute of Graphic Arts, the Graphic Artists Guild, and the CAD Society.

A few of these organizations offer certification programs. Certification in this field is not required by legislation or employers. However, it does demonstrate that those certified understand nationally recognized professional practices and have met specific knowledge standards.

ADDA, for example, offers certification in drafting to those who pass the Drafter Certification Test. Applicants are tested on their knowledge and understanding of basic drafting concepts such as geometric construction, working drawings, and architectural terms and standards. The test

does not, however, cover software specific computer-aided drafting (CAD).

Another example is NTSA's certification program for technical services industry personnel. The certification program is a rigorous study and testing program covering the legal and regulatory aspects of the technical services industry. Technical services industry personnel include engineers, designers, drafters, technical illustrators and writers, computer programmers, information systems specialists, and quality test technicians who provide their services to public and private businesses on a temporary or contract basis.

### **Personal Qualifications**

Technical illustrators should have the patience for detailed, accurate work. Like other drafters, technical illustrators must have artistic sense and creativity. They should be able to visualize objects in three dimensions. They should also have an aptitude for mathematics in order to maintain accurate design measurements and proportions.

Technical illustrators must work well as members of a team with writers, designers, engineers, and other professionals. They should be able to accept constructive criticism or correction of their work.

Occupations can be adapted for workers with disabilities. Persons should contact their school or employment counselors, their state office of vocational rehabilitation, or their state department of labor to explore fully their individual needs and requirements as well as the requirements of the occupation.

### **Where Employed**

Technical illustrators work for technical publishing, communications, and services firms; manufacturers; and government agencies. For example, automobile plants, aircraft and missile plants, electronics firms, and companies that make heavy machinery all employ illustrators. Other technical illustrators are freelancers who have clients; who work by contract for companies; or who submit their work to stock agencies.

### **Employment Outlook**

According to the Bureau of Labor Statistics, the general employment of drafters is expected to grow about as fast as the average for all occupations through the year 2010. Additional job openings will also arise as drafters and technical illustrators leave the labor force or move to other occupations.

Spurring the demand for technical illustrating services will be overall industrial growth, as well as increasingly complex design problems associated with new products and manufacturing processes. More drafters are also doing work traditionally performed by engineers and architects. As technology continues to advance, employers will look

for drafters with a strong background in fundamental drafting principles, a higher level of technical sophistication, and an ability to apply this knowledge to a broader range of responsibilities.

Opportunities will be best for individuals who have at least two years of post-secondary training in a drafting program. Especially important to employers are strong technical skills and considerable skill and experience using CAD systems. Also important to note, a growing number of drafters and technical illustrators are being employed on a temporary or contract basis, as more companies turn to personnel supply services to meet their changing technical needs.

### Entry Methods

Job seekers can apply to employment agencies, stock agencies, engineering firms, or firms that print technical illustrations or technical journals. They can also check with companies that do government work. Graduates of applied arts programs should ask their school counselors for help in arranging job interviews.

Technical illustrators should have a portfolio to show at job interviews. A portfolio is a collection of an artist's best work.

### Advancement

New technical illustrators work for some time before they go beyond routine work. In time they improve their skills and advance to more difficult assignments. After a while they may be in charge of a group of workers or head a department in a plant.

After they get experience in business or industry, technical illustrators may move into freelance work. With talent and perseverance, freelance illustrators may build up a list of clients who use their skills. Illustrators may hire an agent to help them get clients.

Some illustrators move on to a specialty. Medical illustrators and scientific illustrators produce drawings for medicine and science. This kind of work requires special study and preparation acquired by completing accredited programs of study in a school of applied arts or a college of fine arts.

People interested in illustrating and design work might consider the work of industrial designers, medical illustrators, scientific illustrators, commercial artists, interior designers, or jewelry and flatware designers.

### For Further Research

**American Design Drafting Association**, 105 E. Main St. Newbern, TN 38059. Web Site: [www.adda.org](http://www.adda.org)

**American Institute of Graphic Arts**, 164 Fifth Avenue, New York, NY 10010. Web Site: [www.aiga.org](http://www.aiga.org)

**Graphic Artists Guild**, 90 John Street, Suite 403, New York, NY 10038-3202. Web Site: [www.gag.org](http://www.gag.org)

**National Technical Services Association**, Eisenhower Center 1, 2121 Eisenhower Avenue, Suite 604, Alexandria, VA 22314. Web Site: [www.ntsacom](http://www.ntsacom)

**Society for Technical Communication**, 901 N. Stuart Street, Suite 904, Arlington, VA 22203-1822. Web Site: [www.stc.org](http://www.stc.org)

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