

Commercial and Industrial Designers

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Significant Points

- Commercial and industrial designers usually work closely with a range of specialists including engineers, materials scientists, marketing and corporate strategy staff, cost estimators, and accountants.
- About 30 percent are self-employed; many designers work for services firms.
- A bachelor's degree is usually required to start; many designers pursue a master's degree.
- Keen competition for jobs is expected; those with strong backgrounds in engineering and computer-aided design and extensive business expertise will have the best prospects.

Nature of the Work

Commercial and industrial designers combine the fields of art, business, and engineering to design the products people use every day. In fact, these designers are responsible for the style, function, quality, and safety of almost every manufactured good. Usually designers specialize in one particular product category, such as automobiles and other transportation vehicles, appliances, technology goods, medical equipment, furniture, toys, tools and construction equipment, or housewares.

The first steps in developing a new design, or altering an existing one, are to determine the requirements of the client, the purpose of the product, and to the tastes of customers or users. When creating a new design, designers often begin by researching the product user or the context in which the product will be used. They ascertain desired product characteristics, such as size, shape, weight, color, materials used, cost, ease of use, fit, and safety. To gather this information, designers meet with clients, conduct market research, read design and consumer publications, attend trade shows, and visit potential users, suppliers and manufacturers.

Next, designers prepare conceptual sketches or diagrams—by hand or with the aid of a computer—to illustrate their vision of the product. After conducting research and consulting with a creative director or other members of the product development team, designers then create detailed sketches or renderings. Many designers use computer-aided design (CAD) tools to create these renderings. Computer models make it easier to adjust designs and to experiment with a greater number of alternatives, speeding and improving the design process. Industrial designers who work for manufacturing firms also use computer-aided industrial design (CAID) tools to create designs and machine-readable instructions that can direct automated production tools to build the designed product to exact specifications. Often, designers will also create physical models out of clay, wood, and other materials to give clients a better idea of what the finished product will look like.

Designers present the designs and prototypes to their client or managers and incorporate any changes and suggestions. Designers often work with engineers, accountants, and cost esti-

matoms to determine if a product can be made safer, easier to assemble or use, or cheaper to manufacture. Before a product is completed and manufactured, designers may participate in usability and safety tests, watching consumers use prototypes and then making adjustments based on those observations.

Increasingly, designers are working with corporate strategy staff to ensure that their designs fit into the company's business plan and strategic vision. They work with marketing staff to develop plans to best market new product designs to consumers. They work to design products that accurately reflect the company's image and values. And although designers have always tried to identify and design products that fit consumers' needs, more designers are now focused on creating that product before a competitor does. More of today's designers must also focus on creating innovative products as well as considering the style and technical aspects of the product.

Work environment. Designers employed by manufacturing establishments, large corporations, or design firms generally work regular hours in well-lit and comfortable settings. Designers in smaller design consulting firms, or those who freelance, may work under a contract to do specific tasks or designs. They frequently adjust their workday to suit their clients' schedules and deadlines, meeting with the clients evenings or weekends when necessary. Consultants and self-employed designers tend to work longer hours and in smaller, more congested, environments. Additional hours may be required to meet deadlines.

Designers may work in their own offices or studios or in clients' homes or offices. They also may travel to other locations,



Most commercial and industrial designers use computer-aided software to prepare conceptual diagrams.

such as testing facilities, design centers, clients' exhibit sites, users' homes or workplaces, and manufacturing facilities. With the increased speed and sophistication of computers and advanced communications networks, designers may form international design teams and serve a more geographically dispersed clientele.

Training, Other Qualifications, and Advancement

A bachelor's degree is required for most entry-level commercial and industrial design positions. Many designers also pursue a master's degree to increase their employment opportunities.

Education and training. A bachelor's degree in industrial design, architecture, or engineering is required for most entry-level commercial and industrial design jobs. Coursework includes principles of design, sketching, computer-aided design, industrial materials and processes, manufacturing methods, and some classes in engineering, physical science, mathematics, psychology, and anthropology. Many programs also include internships at design or manufacturing firms.

Many aspiring commercial and industrial designers earn a master's degree in industrial design. Some already have a bachelor's degree in the field, but an increasing number have degrees and experience in other areas, such as marketing, information technology, or engineering, and are hoping to transfer into a design occupation.

Also, because of the growing emphasis on strategic design and how products fit into a firm's overall business plan, an increasing number of designers are pursuing a master's degree in business administration to gain business skills.

The National Association of Schools of Art and Design accredits approximately 250 postsecondary colleges, universities, and private institutes with programs in art and design. About 45 of these schools award a degree in industrial design; some offer a bachelor's of art, some a bachelor's of science. Many schools require the successful completion of 1 year of basic art and design courses before entry into a bachelor's degree program. Applicants also may be required to submit sketches and other examples of their artistic ability.

Other qualifications. Creativity and technical knowledge are crucial in this occupation. People in this field must have a strong sense of the esthetic—an eye for color and detail and a sense of balance and proportion. Despite the advancement of computer-aided design, sketching ability remains an important advantage. Designers must also understand the technical aspects of how products function. Most employers also expect new designers to know computer-aided design software. The deciding factor in getting a job often is a good portfolio—examples of a person's best work.

Designers must also be imaginative and persistent and must be able to communicate their ideas visually, verbally, and in writing. Because tastes and styles can change quickly, design-

ers need to be well read, open to new ideas and influences, and quick to react to changing trends. Problem-solving skills and the ability to work independently and under pressure also are important traits. People in this field need self-discipline to start projects on their own, to budget their time, and to meet deadlines and production schedules.

As strategic design becomes more important, employers will seek designers with project management skills and knowledge of accounting, marketing, quality assurance, purchasing, and strategic planning. Good business sense and sales ability are important, especially for those who freelance or run their own business.

Advancement. Beginning commercial and industrial designers usually receive on-the-job training and normally need 1 to 3 years of training before they can advance to higher level positions. Experienced designers in large firms may advance to chief designer, design department head, or other supervisory positions. Some designers leave the occupation to become teachers in design schools or in colleges and universities. Many faculty members continue to consult privately or operate small design studios to complement their classroom activities. Some experienced designers open their own design firms.

Employment

Commercial and industrial designers held about 48,000 jobs in 2006. About 30 percent were self-employed. Another 15 percent of designers were employed in either engineering or specialized design services firms. Manufacturing firms and service providing companies employed most of the rest of commercial and industrial designers.

Job Outlook

Employment is expected to grow about as fast as average. Keen competition for jobs is expected; those with strong backgrounds in engineering and computer-aided design and extensive business expertise will have the best prospects.

Employment change. Employment of commercial and industrial designers is expected to grow 7 percent between 2006 and 2016, about as fast as the average for all occupations. Employment growth will arise from an expanding economy and from an increase in consumer and business demand for new or upgraded products.

Increasing demand for commercial and industrial designers will also stem from the continued emphasis on the quality and safety of products, the increasing demand for new products that are easy and comfortable to use, and the development of high-technology products in consumer electronics, medicine, transportation, and other fields. But increasingly, manufacturers have been outsourcing design work to design services firms to cut costs and to find the most qualified design talent, increasing employment in these firms and reducing it in others, such as

Projections data from the National Employment Matrix

Occupational Title	SOC Code	Employment, 2006	Projected employment, 2016	Change, 2006-2016	
				Number	Percent
Commercial and industrial designers.....	27-1021	48,000	51,000	3,400	7

NOTE: Data in this table are rounded. See the discussion of the employment projections table in the *Handbook* introductory chapter on *Occupational Information Included in the Handbook*.

manufacturing. Additionally, some companies use design firms overseas, especially for the design of high-technology products. These overseas design firms are located closer to their suppliers, which reduces the time it takes to design and sell a product—an important consideration when technology is changing quickly. This offshoring of design work could continue to slow employment growth of U.S. commercial and industrial designers.

Despite the increase in design work performed overseas, most design jobs, particularly jobs not related to high-technology product design, will still remain in the U.S. Design is essential to a firm's success, and firms will want to retain control over the design process.

Job prospects. Competition for jobs will be keen because many talented individuals are attracted to the design field. The best job opportunities will be in specialized design firms which are used by manufacturers to design products or parts of products. Designers with strong backgrounds in engineering and computer-aided design and extensive business expertise will have the best prospects.

As the demand for design work becomes more consumer-driven, designers who can closely monitor, and react to, changing customer demands—and who can work with marketing and strategic planning staffs to come up with new products—will also improve their job prospects.

Employment of designers can be affected by fluctuations in the economy. For example, during periods of economic downturns, companies may cut research and development spending, including new product development.

Earnings

Median annual wage-and-salary earnings for commercial and industrial designers were \$54,560 in May 2006. The middle

50 percent earned between \$41,270 and \$72,610. The lowest 10 percent earned less than \$31,510, and the highest 10 percent earned more than \$92,970. Earnings information for the self-employed are not available. Median annual earnings of salaried commercial and industrial designers in the largest industries that employed them in May 2006 were:

Management of companies and enterprises	\$64,700
Architectural, engineering, and related services	61,890
Engineering services	60,440
Specialized design services.....	52,500

Related Occupations

Workers in other art and design occupations include artists and related workers; fashion designers; floral designers; graphic designers; and interior designers. Some other occupations that require computer-aided design skills are architects, except landscape and naval; computer software engineers; desktop publishers; drafters; and engineers.

Sources of Additional Information

For general career information on commercial and industrial design, contact:

► Industrial Designers Society of America, 45195 Business Court, Suite 250, Dulles, VA 20166.

Internet: <http://www.idsa.org>

For general information about art and design and a list of accredited college-level programs, contact:

► National Association of Schools of Art and Design, 11250 Roger Bacon Dr., Suite 21, Reston, VA 20190.

Internet: <http://nasad.arts-accredit.org>