

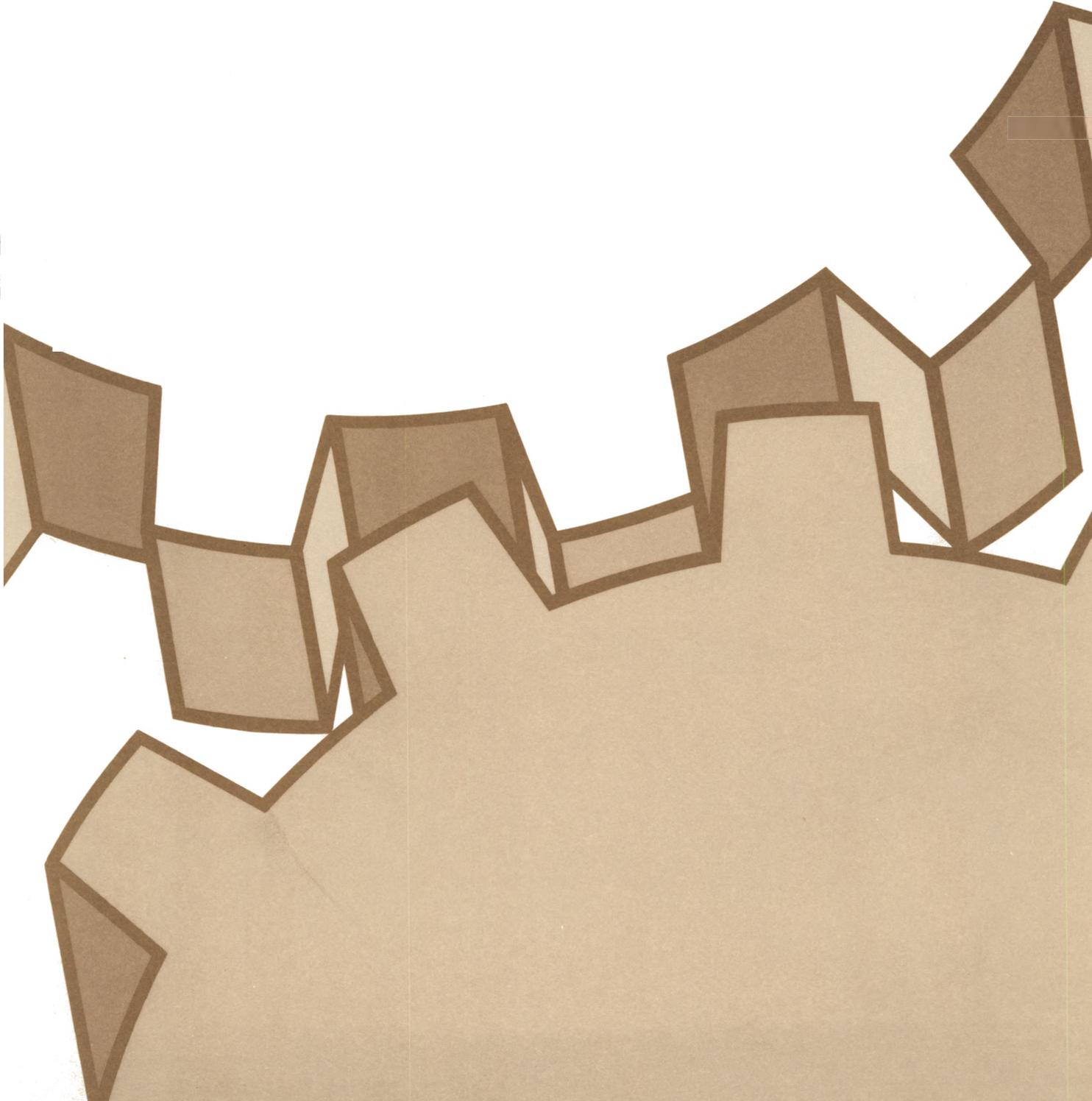
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Occupational Employment in Manufacturing Industries, 1977



U.S. Department of Labor
Bureau of Labor Statistics
March 1980

Bulletin 2057



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U.S. Department of Labor
Ray Marshall, Secretary

Bureau of Labor Statistics
Janet L. Norwood, Commissioner
March 1980

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Preface

This bulletin provides data on occupational employment based on a 1977 survey of manufacturing industries. Earlier surveys were conducted in 1971 and 1974.

The periodic survey is part of a Federal-State cooperative program for occupational employment statistics (OES). The OES program also includes preparation of the National/State Industry-Occupational Matrix—a set of tables showing employment cross-classified by occupation and industry for the Nation and each State. In addition, the program includes Federal assistance to State employment security agencies in developing annual projections of occupational employment for States and areas.

The OES program provides information for many data users, including individuals and organizations engaged in planning vocational educational programs, training programs supported by the Comprehensive

Employment and Training Act, and higher education. OES data also are used to prepare information for career counseling, for job placement activities performed at State employment security offices, and for personnel planning and marketing research conducted by private enterprises.

This bulletin was prepared in the Division of Occupational Outlook by Barbara L. Keitt under the direction of Brian MacDonald. Statistical and data processing support for this effort were provided by Warren Macurdy.

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Contents

	<i>Page</i>
Introduction	1
The manufacturing sector	3

Industry divisions

Food and kindred products	5
Tobacco products	8
Textile mill products	11
Apparel and other textile products	15
Lumber and wood products, except furniture	18
Furniture and fixtures	22
Paper and allied products	26
Printing and publishing	30
Chemicals and allied products	33
Petroleum and coal products	37
Rubber and miscellaneous plastics products	41
Leather and leather products	45
Glass and glass products	49
Stone, clay, and concrete products	53
Primary metals	57
Primary and secondary nonferrous metals	61
Fabricated metal products	64
Machinery, except electrical	68
Electrical and electronic equipment	72
Transportation equipment	76
Instruments and related products	80
Miscellaneous manufacturing industries	84

Charts:

Distribution of employment by major occupational group, 1971 and 1977:

1. Food and kindred products	5
2. Tobacco products	8
3. Textile mill products	11
4. Apparel and other textile products	15
5. Lumber and wood products, except furniture	18
6. Furniture and fixtures	22
7. Paper and allied products	26
8. Chemicals and allied products	33
9. Petroleum and coal products	37
10. Rubber and miscellaneous plastics products	41
11. Leather and leather products	45
12. Glass and glass products	49
13. Stone, clay, and concrete products	53
14. Primary metals	57
15. Primary and secondary nonferrous metals	61

Contents—Continued

	<i>Page</i>
16. Fabricated metal products	64
17. Machinery, except electrical	68
18. Electrical and electronic equipment	72
19. Transportation equipment	76
20. Instruments and related products	80
21. Miscellaneous manufacturing industries	84
 Tables:	
1. Employment in manufacturing industries, 1977	4
2. Employment in manufacturing industries by major occupational group, 1977	4
 Employment, relative standard error, and percentage of establishments reporting selected occupations:	
3. Food and kindred products, June 1977	6
4. Tobacco products, April 1977	9
5. Textile mill products, April 1977	12
6. Apparel and other textile products, May 1977	16
7. Lumber and wood products, except furniture, May 1977	19
8. Furniture and fixtures, June 1977	23
9. Paper and allied products, April 1977	27
10. Printing and publishing, May 1977	31
11. Chemicals and allied products, June 1977	34
12. Petroleum and coal products, May 1977	38
13. Rubber and miscellaneous plastics products, June 1977	42
14. Leather and leather products, May 1977	46
15. Glass and glass products, May 1977	50
16. Stone, clay, and concrete products, May 1977	54
17. Primary metals, April 1977	58
18. Primary and secondary nonferrous metals, April 1977	62
19. Fabricated metal products, June 1977	65
20. Machinery, except electrical, June 1977	69
21. Electrical and electronic equipment, June 1977	73
22. Transportation equipment, June 1977	77
23. Instruments and related products, June 1977	81
24. Miscellaneous manufacturing industries, May 1977	85
 Appendixes:	
A. Survey methods and reliability of estimates	88
B. OES survey data available from State agencies	91

Introduction

The Occupational Employment Statistics (OES) survey is designed to collect data on occupational employment of wage and salary workers by industry in non-farm establishments. The Bureau of Labor Statistics (BLS) provides the procedures and technical assistance for the survey, the State employment security agencies collect the data, and the Employment and Training Administration provides administrative support. In 1977, 43 States (including the District of Columbia) participated in the survey compared with 29 States in 1974 and 16 in 1971. BLS conducted a supplemental survey in 1977, with the financial aid of the National Science Foundation, to develop data for the nonparticipating States.

This bulletin presents national data only. Data on employment in each of the participating States are available from the State employment security agencies (See inside back cover).

Survey procedures

The survey is conducted over a 3-year cycle; manufacturing industries are surveyed in one year and non-manufacturing industries in the other two years. Data are collected from a sample of establishments primarily by mail; telephone followups and personal visits are made when an establishment response is critical to the survey. The survey is based on a probability sample, stratified by industry and size of employment, designed to represent the total or "universe" of establishments covered by the survey. Data are requested for the pay period including the 12th of the reference month, which is standard for all Federal agencies collecting employment data.

For the 1977 survey of manufacturing industries, 22 separate questionnaires were developed, each having detailed occupations related specifically to a particular industry's activity. For example, "patternmaker" was surveyed in only three industries—apparel, furniture, and leather. Cross-industry estimates, therefore, cannot be developed for most detailed occupations because not all detailed occupations were included on every survey questionnaire.

This bulletin presents cross-industry data for major occupational groups. Later, BLS will develop an industry-occupation matrix giving detailed occupations for all sectors based on OES surveys.

Occupational and industrial classification

The OES survey combines two widely used systems—the *Dictionary of Occupational Titles* (DOT) and

the system used for the 1970 Census of Population. Occupational titles and descriptions in the survey are based primarily on the *Dictionary of Occupational Titles*.¹ The DOT was used to develop the definitions of detailed occupations because it is the most detailed classification available. Summary categories and residual groups generally follow the categories used in the 1970 Census and the Current Population Survey. "Crosswalks" have been developed between the two systems so that users may integrate OES data with data from sources using the Census classification.

The OES classification is organized to allow for the changes that are necessary to keep pace with changes in the economy. It also allows for integration of information learned from each successive round of OES surveys.

The industrial classification system is that described in the 1972 *Standard Industrial Classification Manual*,² whereby reporting establishments are classified into industries on the basis of major product or activity.

Concepts

An *establishment* is an economic unit, such as a factory, which processes goods. Generally, it is at a single physical location and is engaged predominantly in one type of economic activity. Where a single physical location encompasses two or more distinct activities, these are treated as separate establishments if separate payroll records are available and certain other criteria are met.

Employment includes full- and part-time workers; workers on paid vacations or other types of leave; workers on unpaid short-term absences (i.e., illness, bad weather, temporary layoff, jury duty); salaried officers, executives, and staff of incorporated firms; employees temporarily assigned to other units; and employees for whom this unit is their permanent (home) duty station, regardless of whether this unit prepares their paycheck. Excluded from coverage are proprietors (owners and partners of unincorporated firms), unpaid family workers, and workers on extended leave (i.e., pensioners and members of the Armed Forces).

Occupation refers to the occupation in which employees are working rather than the occupation for which

¹ *Dictionary of Occupational Titles*, third edition (U.S. Employment Service, U.S. Department of Labor, 1965).

² *Standard Industrial Classification Manual* (Office of Management and Budget, Executive Office of the President, 1972).

they may have been trained. For example, an employee trained as an engineer but working as a drafter is reported as a drafter.

Working supervisors (those spending 20 percent or more of their time at work similar to that done by workers under their supervision) are reported in the occupations most closely related to their work.

Part-time workers, learners, and apprentices are reported in the occupation in which they ordinarily work.

A more detailed statement describing the survey is presented in appendix A.

Data presented

This bulletin presents occupational employment for all manufacturing industries combined and for all major industry groups (2-digit SIC level) within manufacturing (except SIC's 32 and 33, which are at the 3-digit SIC level¹). Data are presented for each industry under the following headings: Employment, percent of total employment, relative error, and percent of establishments reporting the occupation.

Employment is based upon survey results adjusted to reflect total industry employment. The percent of total employment refers to total employment in the industry. The relative error is a measure of the level of confidence to be placed on each estimate. The percent of establishments reporting a particular occupation indicates the frequency of occurrence of the occupation.

Occupations with less than .05 percent of industry employment or with a relative error greater than 50 are not shown separately but are included in the appropriate residual categories.

Employment is rounded to the nearest ten. The relative standard error and the percent of respondents reporting the occupation are rounded to the nearest whole percent. The percent of total employment was computed from rounded employment data.

¹Other data at the 3-digit SIC level are available upon request from the Office of Employment Structure and Trends. Definitions for all occupations surveyed are also available from this Office upon request.

The Manufacturing Sector

In 1977, about 19.7 million wage and salary workers were employed in the manufacturing sector, accounting for about one-fourth of the Nation's employment. Over half of the workers in manufacturing employment were concentrated in 6 of the 22 major industry groups. As shown in table 1, durable goods industries accounted for over half of all manufacturing employment. Among these, the largest were the machinery (other than electrical), transportation equipment, and electrical and electronic equipment industries, which each employed about one-tenth of the workers in manufacturing.

Characteristically, employment in manufacturing is heavily concentrated in production, maintenance, and repair occupations. These occupations and construction, material handling, and powerplant occupations include all skilled, semiskilled, and unskilled workers performing machine and manual work. As shown in table 2, 14.0 million workers or 70 percent of the wage and salary workers in manufacturing in 1977 were employed in these occupations.

Clerical occupations, accounting for 2.2 million workers or 11 percent of manufacturing employment, make up the second largest occupational group in all manufacturing industries combined and in each industry division within manufacturing, except for transportation. Clerical occupations are classified into two subgroups—office clerical workers and plant clerical workers. Office clerical occupations accounted for 1.5 million workers.

Professional workers, totaling 1.2 million, were the third largest group employed in manufacturing. Professional occupations are categorized as either scientific or nonscientific. Most professional workers in manufacturing, 97 percent in 1977, are employed in scientific occupations. Of these, the largest number, 506,700 in 1977, are engineers.

Managers and officers accounted for 6 percent of manufacturing employment. Occupations in this group include plant, office, and sales managers; and corporate officers such as president, secretary, and treasurer. In 1977, employment of managers and officers registered a modest increase in 18 industry divisions.

Technical occupations, accounting for 2 percent of manufacturing employment in 1977, ranked fifth. Workers in this group assist in scientific and engineering research, development, testing, and related activities; and in operating and programming technical equipment and systems.

Sales employment, also accounting for 2 percent of manufacturing employment, includes two broadly defined occupations—sales clerk, and sales representative-agent-associate. The latter accounted for 376,000 workers in 1977.

Service worker employment in manufacturing comprises several occupations—cleaning, property protection, and food preparation and serving. The occupational group accounted for 2 percent of manufacturing employment.

Table 1. Employment in manufacturing industries, 1977

Industry	Employment	Percent of total manufacturing employment
TOTAL	19,721,350	100.0
DURABLE GOODS INDUSTRIES, TOTAL ..	11,621,780	58.9
Lumber and wood products, except furniture	714,360	3.6
Furniture and fixtures products	462,660	2.3
Glass and glass products	199,060	1.0
Stone, clay, and concrete products	471,830	2.4
Primary metals	1,094,610	5.6
Primary and secondary nonferrous metals	86,330	.4
Fabricated metal products	1,588,640	8.1
Machinery, except electrical	2,174,070	11.0
Electric and electronic equipment	1,882,730	9.5
Transportation equipment	1,889,390	9.6
Instruments and related products	618,870	3.1
Miscellaneous manufacturing industries	439,230	2.2
NONDURABLE GOODS INDUSTRIES, TOTAL	8,099,570	41.1
Food and kindred products	1,710,910	8.7
Tobacco products	70,940	.4
Textile mill products	913,700	4.6
Apparel and other textile products	1,318,700	6.7
Paper and allied products	686,140	3.5
Printing and publishing	1,132,880	5.7
Chemicals and allied products	1,081,980	5.5
Petroleum and coal products	202,830	1.0
Rubber and miscellaneous plastics products	721,530	3.7
Leather and leather products	259,960	1.3

Table 2. Employment in manufacturing industries by major occupational group, 1977

Industry	Managers and officers	Professional workers	Technical workers	Service workers	Production, maintenance, construction, repair, material handling, and powerplant workers	Clerical workers	Sales workers
All manufacturing	1,126,980	1,163,730	497,790	390,000	13,963,950	2,159,500	419,400
Food and kindred products	108,480	29,570	12,380	67,880	1,259,250	170,470	62,880
Tobacco products	3,360	2,880	1,800	3,410	52,450	6,550	490
Textile mill products	28,340	14,880	7,800	17,660	764,090	73,380	7,550
Apparel and other textile products	45,010	13,670	1,860	17,070	1,105,630	116,890	18,570
Lumber and wood products, except furniture	34,630	11,050	6,010	13,270	597,170	42,560	9,670
Furniture and fixtures products	19,500	8,980	3,220	7,930	369,780	43,190	10,060
Paper and allied products	33,000	23,050	5,610	11,630	531,640	65,730	15,480
Printing and publishing	97,070	116,150	5,280	19,250	582,510	239,570	73,050
Chemicals and allied products	96,960	124,540	54,750	25,740	564,030	160,600	55,360
Petroleum and coal products	13,580	25,090	8,200	3,600	120,130	29,510	2,720
Rubber and miscellaneous plastics products	37,090	21,780	11,550	11,150	568,200	60,890	10,870
Leather and leather products	7,540	3,100	420	3,710	219,150	22,260	3,780
Glass and glass products	8,130	5,710	2,570	3,840	161,640	14,760	2,410
Stone, clay, and concrete products	33,840	12,420	6,460	6,520	358,350	43,870	10,370
Primary metals	39,620	36,990	17,640	21,890	877,100	93,130	8,240
Primary and secondary nonferrous metals	3,840	4,670	2,090	1,990	67,910	5,530	300
Fabricated metal products	90,880	65,850	33,350	27,290	1,191,810	150,040	29,420
Machinery, except electrical	156,480	176,570	116,110	36,770	1,368,450	279,890	39,800
Electric and electronic equipment	105,240	202,780	102,310	28,500	1,201,160	222,600	20,140
Transportation equipment	86,900	194,140	56,780	44,280	1,330,380	165,870	11,040
Instruments and related products	47,680	56,680	37,200	9,950	361,170	92,410	13,780
Miscellaneous manufacturing industries	29,810	13,180	4,400	6,670	311,950	59,800	13,420

Food and Kindred Products

This industry group includes establishments manufacturing or processing foods, beverages, and related products such as ice, chewing gum, and vegetable and animal fats and oils.

In 1977, the industry employed 1.7 million workers or 9 percent of all workers employed in manufacturing. From 1971 to 1977, employment in the industry declined 2 percent.

The most populous occupations in the food industry, as shown in table 3, were: Production packagers (hand or machine), with 231,600 workers or 14 percent of total industry employment; delivery and route workers, 133,600 or 8 percent; and cannery workers, 79,300 or 5 percent.

The occupational distribution of employment is shown in chart 1.

Chart 1. Food and kindred products: Distribution of employment by major occupational group, 1971 and 1977

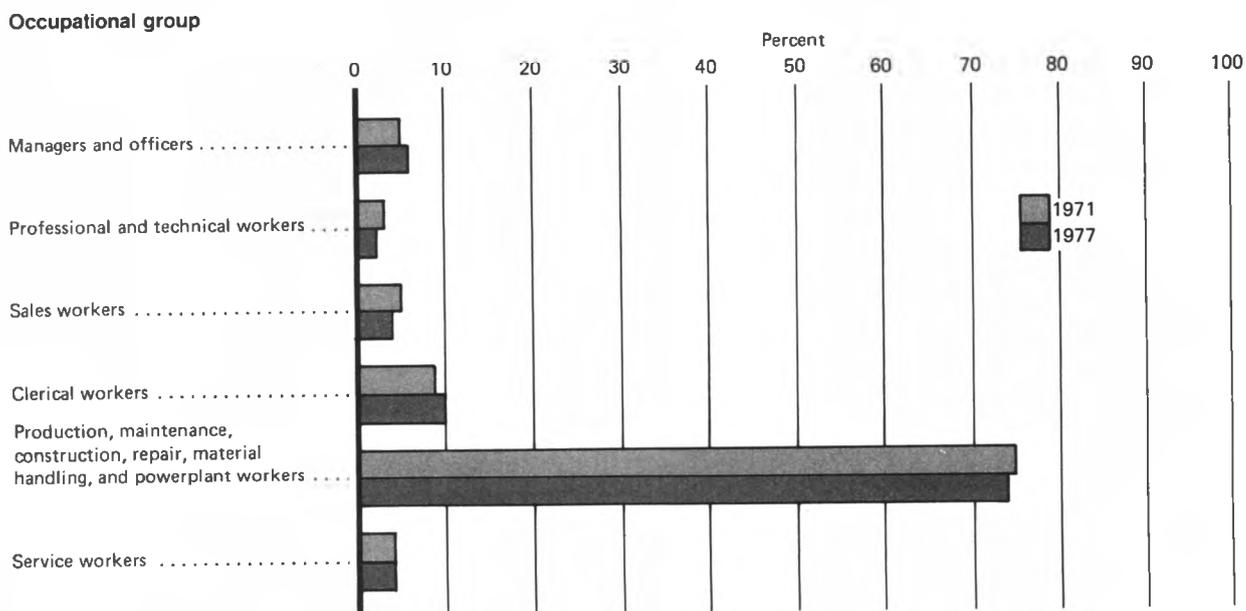


Table 3. Food and kindred products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ June 1977

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
TOTAL	1,710,910	100.00	-	100
MANAGERS AND OFFICERS	108,480	6.34	2	72
PROFESSIONAL OCCUPATIONS	29,570	1.70	n.a.	n.a.
All other engineers	3,470	.20	n.a.	n.a.
Mathematical scientist	60	.00	n.a.	n.a.
Chemist	4,660	.27	9	5
All other physical scientists	170	.00	n.a.	n.a.
Life scientist	590	.03	n.a.	n.a.
Purchasing agent and/or buyer	3,810	.22	5	7
Accountant and/or auditor	12,690	.74	6	20
All other professional workers	4,120	.24	n.a.	n.a.
TECHNICAL OCCUPATIONS	12,380	.70	n.a.	n.a.
Engineering technician	1,130	.06	n.a.	n.a.
Biological science technician	8,000	.46	7	7
All other science technicians	1,060	.06	n.a.	n.a.
All other technicians	2,190	.12	n.a.	n.a.
SERVICE OCCUPATIONS	67,880	3.95	n.a.	n.a.
Janitor, porter, and/or cleaner	60,320	3.52	2	40
Guard and/or doorkeeper	2,970	.17	7	3
Food service workers	3,670	.21	16	2
All other service workers	920	.05	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	1,259,250	73.24	n.a.	n.a.
Mechanic, automotive	13,880	.81	3	16
Mechanic, maintenance	31,280	1.82	3	19
Coin-machine servicer and/or vending machine - repairer	5,610	.32	4	6
All other mechanics and repairers	540	.03	n.a.	n.a.
Truck driver	46,260	2.70	2	35
Cook and/or cooker	12,190	.71	4	11
Delivery and/or route worker	133,640	7.81	2	35
Extractor operator and/or extractor plant operator ..	1,520	.08	13	1
Electrician	5,560	.32	6	5
Supervisor, nonworking	61,400	3.58	2	36
Industrial truck operator	40,780	2.38	3	25
Inspector	13,660	.79	5	10
Machinist	6,480	.37	8	5
Maintenance repairer, general utility	48,040	2.80	2	34
Helper, trades	9,280	.54	11	5
Mixer	35,410	2.06	3	31
Order filler	27,890	1.63	3	18
Oven operator	6,340	.37	4	5
Production packager, hand or machine	231,570	13.53	2	46
Stationary boiler firer	1,360	.07	11	1
Stationary engineer	1,080	.06	11	1
Drier operator	5,380	.31	7	4
Baker	8,010	.46	6	5
Baker helper	16,340	.95	5	5
Boner, meat	16,230	.94	10	5
Boner, poultry	9,890	.57	18	1
Butcher, all-around	21,510	1.25	8	7
Candy maker	2,430	.14	17	1
Carcass splitter	6,440	.37	12	3
Casing finisher and/or stuffer	6,840	.39	11	4
Cheesemaker	2,640	.15	8	3
Cheesemaker helper	6,100	.35	10	3
Chicken cutter	13,150	.76	17	1
Cooler room worker, meat	8,520	.49	9	4
Dairy processing equipment operator	11,040	.64	5	8
Dividing-machine operator and/or dough-brake machine operator	4,830	.28	6	4
Feed pellet mill operator	2,610	.15	8	3
Flavor-room worker and/or freezer operator	3,070	.17	9	3
Ingredient scaler	1,990	.11	7	3

See footnotes at end of table.

Table 3. Food and kindred products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ June 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Meat grinder	3,500	0.20	7	5
Miller	6,140	.35	7	5
Novelty worker	3,860	.22	13	1
Poultry dresser and/or eviscerator	56,540	3.30	8	2
Pumper	1,650	.09	10	2
Raw cheese worker	1,730	.10	24	1
Retort operator	1,560	.09	10	2
Shellfish-processing-machine tender	1,120	.06	46	0
Shellfish shucker	4,960	.28	19	1
Skin peeling machine operator	1,290	.07	11	2
Skinner, animal	5,460	.31	9	4
Smoker	2,130	.12	7	3
Stunner	1,380	.08	8	4
Sugar boiler	1,500	.08	23	1
Tester	8,970	.52	4	12
Cutting machine operator, food	11,770	.68	5	9
Farm equipment operator	3,540	.20	15	1
Fish cleaner, hand and/or butcher, fish	8,800	.51	14	1
Fermentation operator	1,570	.09	14	1
Cannery worker	79,330	4.63	2	4
Food shaper, hand	4,490	.26	10	3
Depositor, food	5,090	.29	9	4
Pickler, food	1,760	.10	11	2
Washer and/or separator, food	13,530	.79	9	6
Grader food and/or skins	6,510	.38	7	5
Equipment cleaner, hand	5,080	.29	12	2
All other skilled craft and kindred workers	6,820	.39	n.a.	n.a.
All other operatives and semiskilled workers	38,720	2.26	n.a.	n.a.
All other laborers and unskilled workers	89,660	5.24	n.a.	n.a.
CLERICAL OCCUPATIONS	170,470	9.87	n.a.	n.a.
Computer operator	1,240	.07	11	2
Keypunch operator	2,040	.11	7	2
All other office machine operators	980	.05	n.a.	n.a.
Accounting clerk	22,070	1.28	2	27
Bookkeeper, hand	8,930	.52	3	25
General clerk, office	47,220	2.75	3	41
Order clerk	3,300	.19	7	5
Secretary	22,820	1.33	5	34
Typist	1,460	.08	10	3
All other office clerical workers	4,940	.28	n.a.	n.a.
Shipping packer	25,490	1.48	3	16
Shipping and/or receiving clerk	17,330	1.01	3	27
Weigher, record-keeping	2,020	.11	9	3
Stock clerk, stockroom, warehouse or storage yard	9,210	.53	5	10
All other plant clerical workers	1,420	.08	n.a.	n.a.
SALES OCCUPATIONS	62,880	3.66	8	41
Sales representative, sales agent, and/or sales associate	42,760	2.49	3	30
Sales clerk	20,120	1.17	6	11

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Tobacco Products

This industry group includes establishments engaged in manufacturing cigarettes, cigars, smoking and chewing tobacco, and snuff, and in stemming and redrying tobacco.

In 1977, the industry employed 71,000 workers or 0.4 percent of all workers employed in manufacturing. Employment declined less than a percentage point between 1971 and 1977.

The most populous occupations in the tobacco industry, as shown in table 4, were: Production packagers (hand or machine), with 6,200 workers or 9 percent of total industry employment; cigarette-making machine operators, 4,100 or 6 percent; and machine adjusters, 3,800 or 5 percent.

The occupational distribution of employment is shown in chart 2.

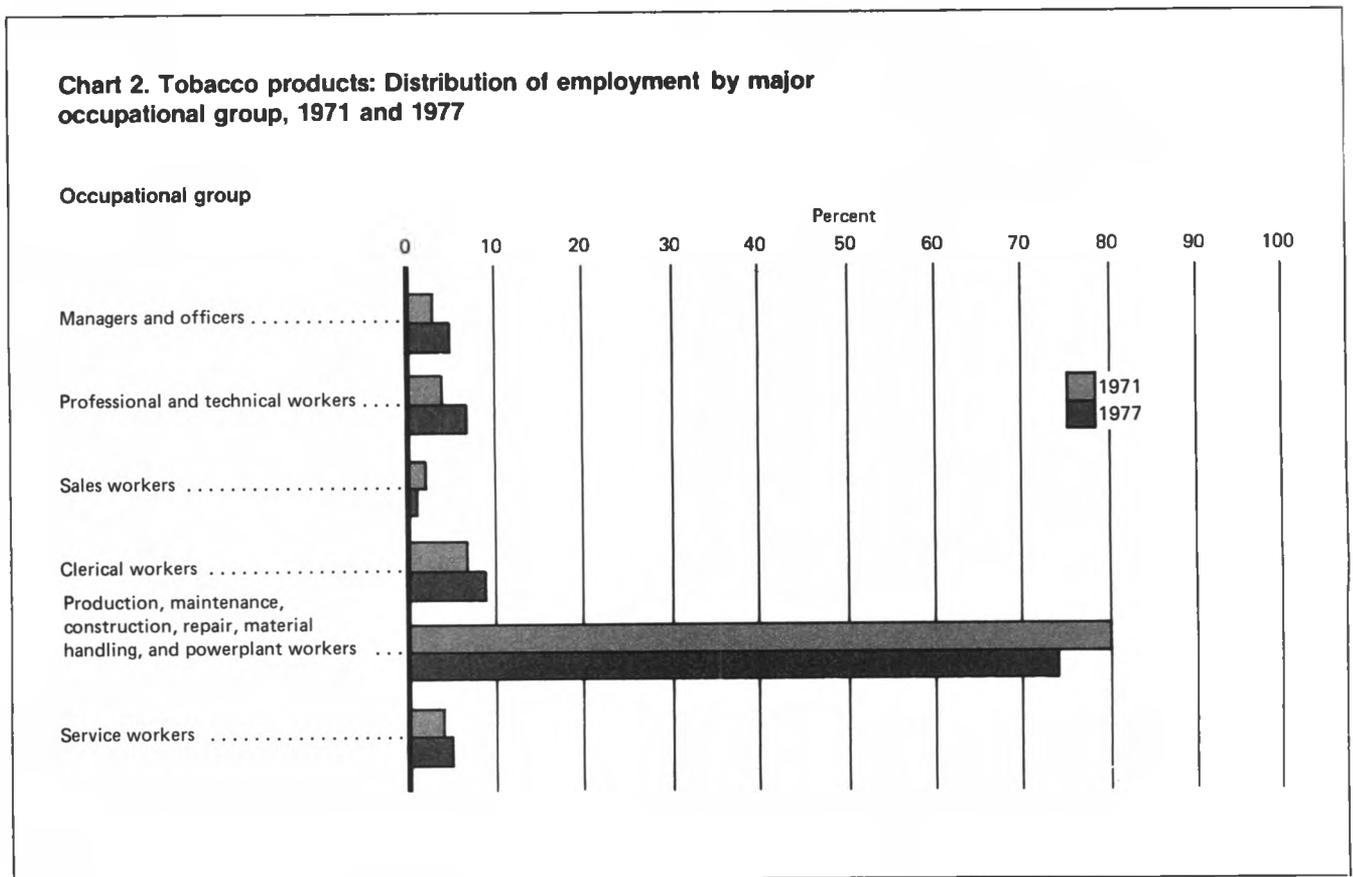


Table 4. Tobacco products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ April 1977

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
TOTAL	70,940	100.00	-	100
MANAGERS AND OFFICERS	3,360	4.73	12	92
PROFESSIONAL OCCUPATIONS	2,880	4.00	n.a.	n.a.
Industrial engineer	120	.16	12	17
Mechanical engineer	110	.15	11	22
All other engineers	320	.45	n.a.	n.a.
Chemist	800	1.12	29	8
Systems analyst, electronic data processing	140	.19	30	13
Purchasing agent and/or buyer	450	.63	27	31
Accountant and/or auditor	390	.54	24	34
Nurse, professional	180	.25	18	21
Personnel and labor relations specialists	230	.32	39	17
All other professional workers	140	.19	n.a.	n.a.
TECHNICAL OCCUPATIONS	1,800	2.49	n.a.	n.a.
Computer programmer	190	.26	29	14
Drafter	80	.11	16	10
Electrical and/or electronic technician	70	.09	19	12
All other engineering technicians	220	.30	n.a.	n.a.
Science technicians	1,000	1.40	28	7
All other technicians	240	.33	n.a.	n.a.
SERVICE OCCUPATIONS	3,410	4.78	n.a.	n.a.
Janitor, porter, and/or cleaner	2,550	3.59	28	51
Guard and/or doorkeeper	530	.74	13	29
Food service workers	50	.07	31	12
Supervisor, nonworking--service only	70	.09	13	12
All other service workers	210	.29	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	52,450	73.65	n.a.	n.a.
Mechanic, automotive	60	.08	19	13
Mechanic, maintenance	520	.73	22	23
Refrigeration mechanic and/or air conditioning - mechanic	110	.15	38	7
Machine adjuster	3,800	5.35	10	32
Cooper, hogshead	240	.33	16	12
All other mechanics and repairers	100	.14	n.a.	n.a.
Truck driver	340	.47	11	30
Carpenter	110	.15	35	19
Cook and/or cooker	180	.25	14	16
Electrician	610	.85	10	32
Supervisor, nonworking	3,190	4.49	14	55
Industrial truck operator	1,080	1.52	10	33
Inspector	1,300	1.83	9	21
Leaf conditioner and/or caser	180	.25	12	26
Machinist	700	.98	15	24
Maintenance repairer, general utility	230	.32	12	31
Helper, trades	100	.14	19	12
Mixer	240	.33	14	23
Millwright	310	.43	22	10
Oiler	520	.73	25	25
Order filler	150	.21	40	13
Painter, maintenance	50	.07	19	7
Plumber and/or pipefitter	230	.32	22	13
Production packager, hand or machine	6,250	8.80	15	54
Stem-roller-or-crusher operator	70	.09	20	9
Sheet metal worker	130	.18	15	7
Stationary boiler firer	160	.22	10	17
Stationary engineer	120	.16	18	11
Sorter, selector and/or grader, tobacco	220	.30	22	23
Welder and/or flamecutter	70	.09	22	14
Drier operator	240	.33	12	31
Bunch maker, machine	680	.95	12	16
Casing machine operator	90	.12	10	14
Cigarette filter making machine operator	1,480	2.08	11	6
Cigarette making machine operator	4,070	5.73	8	5

See footnotes at end of table.

Table 4. Tobacco products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ April 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Making machine catcher	2,670	3.76	20	6
Ordering machine operator	80	.11	31	12
Picker	2,070	2.91	30	25
Shaker	300	.42	26	16
Stemmer, hand	230	.32	17	8
Stemmer, machine	450	.63	8	22
Tester	230	.32	37	17
Thresher	60	.08	17	12
Wrapper layer	1,750	2.46	4	25
Cutter and/or grinder operator	250	.35	16	22
Feeder-catcher, tobacco	300	.42	24	12
Cigar maker, hand	170	.23	18	12
All other skilled craft and kindred workers	270	.38	n.a.	n.a.
All other operatives and semiskilled workers	2,720	3.83	n.a.	n.a.
All other laborers and unskilled workers	12,970	18.26	n.a.	n.a.
CLERICAL OCCUPATIONS				
Computer operator	6,550	9.13	n.a.	n.a.
Keypunch operator	170	.23	31	16
All other office machine operators	180	.25	16	21
Stenographer	100	.14	n.a.	n.a.
Accounting clerk	90	.12	12	17
Bookkeeper, hand	540	.76	18	40
File clerk	120	.16	26	20
General clerk, office	130	.18	31	12
Order clerk	710	1.00	28	42
Payroll and/or timekeeping clerk	310	.43	33	13
Personnel clerk	300	.42	13	45
Procurement clerk	100	.14	15	21
Receptionist	50	.07	25	16
Secretary	60	.08	33	9
Switchboard operator-receptionist	740	1.04	26	44
Typist	70	.09	13	35
Clerical supervisor, office or plant	370	.52	25	24
All other office clerical workers	400	.56	24	26
Production clerk and/or coordinator	780	1.09	n.a.	n.a.
Shipping packer	130	.18	33	12
Shipping and/or receiving clerk	90	.12	9	23
Weigher, record-keeping	320	.45	22	36
Stock clerk, stockroom, warehouse or storage yard	140	.19	19	17
All other plant clerical workers	330	.46	12	31
SALES OCCUPATIONS				
Sales representative, sales agent, and/or sales associate	490	.69	n.a.	n.a.
	490	.69	21	21

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Textile Mill Products

This industry group includes establishments performing any of the following operations: (1) Preparing fiber and subsequent manufacturing of yarn, thread, braids, twine, and cordage; (2) manufacturing woven fabric, knit fabric, and carpet and rugs from yarn; (3) dyeing and finishing fiber, yarn, fabric, and knit apparel; (4) coating, waterproofing, or otherwise treating fabric; (5) the integrated manufacture of knit apparel and other finished articles from yarn; and (6) the manufacture of felt goods, lace goods, nonwoven fabrics, and miscellaneous textiles.

In 1977, the industry employed 914,000 workers or 5 percent of all workers employed in manufacturing. Employment declined 4 percent between 1971 and 1977.

The most populous occupations in the textile mill products industry, as shown in table 5, were: Sewing machine operators, regular equipment—garment, with 38,700 workers; weavers, 36,700; and nonworking supervisors for production and other blue-collar occupations, 32,900.

The occupational distribution of employment is shown in chart 3.

Chart 3. Textile mill products: Distribution of employment by major occupational group, 1971 and 1977

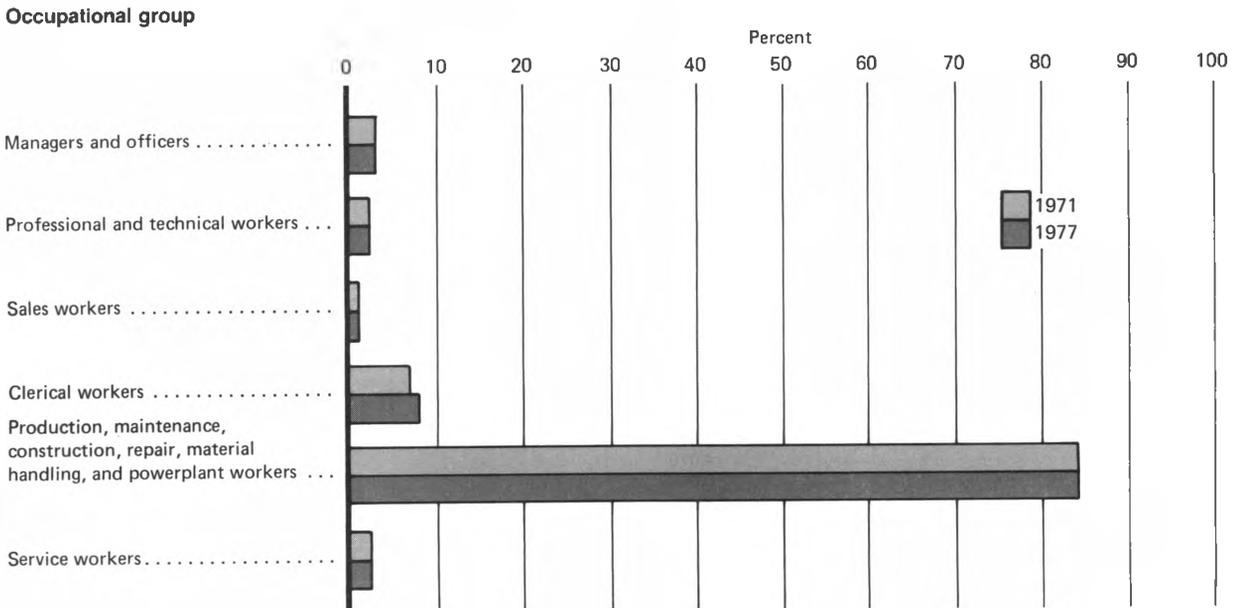


Table 5. Textile mill products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ April 1977

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
TOTAL	913,700	100.00	-	100
MANAGERS AND OFFICERS	28,340	3.10	3	88
PROFESSIONAL OCCUPATIONS	14,880	1.56	n.a.	n.a.
Industrial engineer	2,100	.22	3	20
Mechanical engineer	1,070	.11	5	13
All other engineers	1,070	.11	n.a.	n.a.
Mathematical scientist	40	.00	n.a.	n.a.
Chemist	1,010	.11	8	9
All other physical scientists	40	.00	n.a.	n.a.
Systems analyst, electronic data processing	730	.07	13	6
Purchasing agent and/or buyer	1,240	.13	4	19
Accountant and/or auditor	2,500	.27	4	25
Personnel and labor relations specialists	1,890	.20	3	25
Designer	1,380	.15	7	11
All other professional workers	1,810	.19	n.a.	n.a.
TECHNICAL OCCUPATIONS	7,800	.83	n.a.	n.a.
Computer programmer	740	.08	6	8
Engineering technician	1,110	.12	7	9
Colorist	1,620	.17	5	13
All other science technicians	2,550	.27	n.a.	n.a.
All other technicians	1,780	.19	n.a.	n.a.
SERVICE OCCUPATIONS	17,660	1.91	n.a.	n.a.
Janitor, porter, and/or cleaner	10,660	1.16	3	49
Guard and/or doorkeeper	3,810	.41	3	20
Food service workers	460	.05	n.a.	n.a.
Supervisor, nonworking--service only	1,070	.11	9	6
All other service workers	1,660	.18	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	764,090	83.03	n.a.	n.a.
Mechanic, automotive	550	.06	8	5
Mechanic, maintenance	8,440	.92	4	25
Knitting-machine fixer	10,820	1.18	3	20
Loom fixer	19,140	2.09	3	16
Section repairer and setter	14,250	1.55	4	15
Mechanic, sewing machine	1,700	.18	6	12
All other mechanics and repairers	4,060	.44	n.a.	n.a.
Presser, hand	1,000	.10	11	3
Presser, machine	1,170	.12	9	4
Truck driver	3,670	.40	5	25
Carpenter	1,500	.16	8	15
Drawer-in, hand	1,680	.18	7	8
Electrician	4,250	.46	3	28
Supervisor, nonworking	32,880	3.59	2	56
Industrial truck operator	9,840	1.07	3	27
Inspector	25,490	2.78	3	38
Instructor, apparel and textile machines	1,810	.19	6	9
Machinist	4,010	.43	4	22
Maintenance repairer, general utility	6,840	.74	3	35
Helper, trades	3,640	.39	7	13
Millwright	1,100	.12	10	5
Oiler	3,040	.33	3	18
Order filler	4,440	.48	6	16
Painter, maintenance	620	.06	8	7
Plumber and/or pipefitter	770	.08	8	8
Production packager, hand or machine	14,230	1.55	5	28
Sewing machine operator, regular equipment--garment	38,680	4.23	3	11
Sewing machine operator, special equipment and/or automatic equipment--garment	7,200	.78	9	8
Sewing-machine operator, regular equipment- non-garment	16,200	1.77	5	16
Sewing-machine operator, special equipment and/or automatic equipment-nongarment	4,190	.45	19	5

See footnotes at end of table.

Table 5. Textile mill products: Employment, relative standard error, and percent of establishments reporting selected occupations, April 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Spooler operator, automatic	8,130	0.88	7	7
Stationary boiler firer	1,240	.13	5	8
Welder and/or flamecutter	680	.07	6	8
Weaver	36,680	4.01	4	19
Ager operator	660	.07	12	3
Backtender, cloth printing	2,550	.27	13	3
Battery loader	8,920	.97	6	7
Beam-dyer operator and/or package-dyeing-- machine operator	2,220	.24	8	5
Beam-warper tender, automatic and/or beamer	7,690	.84	6	18
Bleach-range operators and/or knit-goods bleachers	1,730	.18	11	4
Blending-machine operator	2,350	.25	7	8
Boarding-machine operator, hosiery	5,080	.55	7	4
Bobbin sorter	1,190	.13	9	5
Bobbin winder, machine or sewing machine	3,020	.33	9	7
Boil-off machine operator, cloth	600	.06	13	2
Braiding machine operator	2,480	.27	10	4
Burler	3,820	.41	8	6
Calender operator, cloth pressing	1,400	.15	8	6
Calendering-machine operator, knit goods tubing	1,000	.10	9	4
Card grinder	1,460	.15	6	8
Card tender, comber tender, and/or card stripper	10,440	1.14	4	17
Drawing-frame tenders and/or gill-box tenders	8,080	.88	4	13
Cloth feeder and/or back tender	4,950	.54	9	9
Cloth-finishing-range tender, middle	2,440	.26	10	6
Cloth-finishing-range operator, chief	2,460	.26	8	6
Cloth printer	2,570	.28	9	5
Cloth-shrinking-machine operator	1,040	.11	9	3
Cloth trimmer, machine and/or shearing-machine - operator	2,340	.25	7	9
Cloth or carpet winder	2,660	.29	6	9
Coating machine operator	3,080	.33	10	7
Creeler, yarn	15,670	1.71	4	21
Cutter, portable machine	3,000	.32	7	12
Doffer	23,090	2.52	3	21
Drawing-in-machine tender	1,230	.13	10	5
Dresser tender	570	.06	13	2
Dye-range operator and spiral-dye-beck tenders	3,870	.42	9	7
Dye-reel operator, jigger, and/or padding-machine - operator	3,210	.35	8	6
Dye-tank tender, nets; warp-dyeing-vat tender, and/or knit-goods-yarn dyer, vat	780	.08	16	2
Dye-tub operator, random dyer, and/or spot-- dyeing-and-winding machine operator	3,290	.36	6	9
Fuller, textile	580	.06	13	2
Hand sewer	830	.09	14	3
Harness builder, loom changer and/or loom starter	1,590	.17	7	7
Harness placer	2,510	.27	7	5
Knitter, full-fashioned garment	1,340	.14	18	1
Knitting-machine operator	20,840	2.28	4	18
Laminating-machine operator and/or spreader machine tender	1,260	.13	16	2
Loom-winder tender	3,930	.43	12	3
Looper, hosiery	1,330	.14	14	2
Mender, cloth	4,170	.45	7	10
Mercerizer operator and/or mangle tender	690	.07	14	2
Napper tender	1,710	.18	14	5
Needle-felt-making-machine operator and/or - needle loom operator	1,030	.11	12	2
Opener tender and/or waste-machine tender	3,350	.36	5	11
Picker tender	3,120	.34	6	9
Quilling-machine operator, automatic or non-- automatic	2,670	.29	9	7
Rope laying machine operator	630	.06	30	1
Rubber-covering-machine operator	1,330	.14	14	2
Seamless-hosiery knitter	5,310	.58	7	4

See footnotes at end of table.

Table 5. Textile mill products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ April 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Skein-yarn dyer	1,010	0.11	12	3
Slasher tender	3,570	.39	5	7
Slubber tender	5,820	.63	5	8
Smash hand	3,690	.40	4	9
Speeder tender	2,050	.22	10	3
Spinner, frame	30,820	3.37	3	16
Staple cutters and/or staple-processing-machine - operators	780	.08	16	2
Tenter-frame operator	4,020	.43	6	10
Tester	4,360	.47	5	18
Threader, knit goods	630	.06	12	2
Twister tender	13,000	1.42	5	14
Warp-knitting-machine operator	2,530	.27	13	2
Warp-tying-machine tender	4,010	.43	5	11
Winder operator, automatic	13,940	1.52	4	16
Texturizer and/or crimp setter	4,650	.50	12	2
Yarn winder	19,120	2.09	5	17
Cloth grader	8,890	.97	5	12
Folder, hand	10,320	1.12	5	12
Folding machine operator	2,090	.22	10	7
Cutter machine	3,930	.43	7	11
Autoclave operator	740	.08	11	4
Drier operator, textiles and rugs	3,090	.33	6	10
Screen or stencil printer and/or setter	2,180	.23	10	4
Mixer and/or blender, chemicals and chemical - products	4,900	.53	5	17
All other skilled craft and kindred workers	7,170	.78	n.a.	n.a.
All other operatives and semiskilled workers	45,120	4.93	n.a.	n.a.
All other laborers and unskilled workers	68,560	7.50	n.a.	n.a.
CLERICAL OCCUPATIONS				
Bookkeeping and/or billing machine operator	73,380	7.93	n.a.	n.a.
Computer operator	990	.10	5	11
Keypunch operator	1,100	.12	6	11
All other office machine operators	2,070	.22	4	14
Accounting clerk	690	.07	n.a.	n.a.
Bookkeeper, hand	2,610	.28	4	21
File clerk	1,120	.12	5	15
General clerk, office	920	.10	6	9
Order clerk	10,690	1.16	4	46
Payroll and/or timekeeping clerk	2,930	.32	11	15
Personnel clerk	3,930	.43	3	41
Procurement clerk	1,290	.14	3	20
Secretary	890	.09	4	13
Statistical clerk	5,600	.61	3	42
Switchboard operator-receptionist	760	.08	6	7
Typist	1,370	.14	2	26
Clerical supervisor, office or plant	1,750	.19	5	13
All other office clerical workers	2,520	.27	5	19
Production clerk and/or coordinator	3,290	.36	n.a.	n.a.
Shipping packer	4,490	.49	4	26
Shipping and/or receiving clerk	9,470	1.03	3	43
Weigher, record-keeping	6,300	.68	3	51
Stock clerk, stockroom, warehouse or storage yard	920	.10	8	6
All other plant clerical workers	4,590	.50	4	26
SALES OCCUPATIONS				
Sales representative, sales agent, and/or sales associate	7,550	.81	22	27
Sales clerk	6,640	.72	8	22
	910	.09	14	5

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Apparel and Other Textile Products

This industry group includes establishments producing clothing and fabricating products by cutting and sewing purchased woven or knit textile fabrics and related materials such as leather, rubberized fabrics, plastics, and furs.

In 1977, the industry employed 1.3 million workers or 7 percent of all workers employed in manufacturing. Employment declined 2 percent between 1971 and 1977.

The most populous occupations in the apparel industry, as shown in table 6, were: Regular and automatic sewing machine operators for garment and nongarment items, 697,000 workers or 53 percent of total industry employment. Among these, regular sewing machine operators working on garments were the most numerous.

The occupational distribution of employment is shown in chart 4.

Chart 4. Apparel and other textile products: Distribution of employment by major occupational group, 1971 and 1977

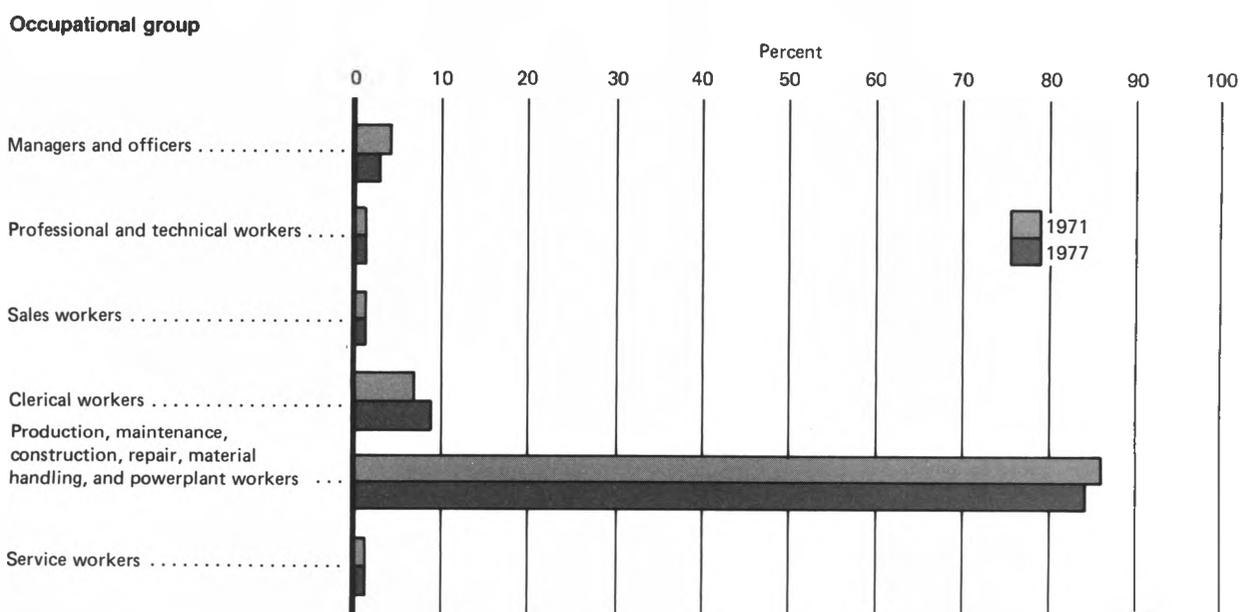


Table 6. Apparel and other textile products: Employment, relative standard error, and percent of establishments reporting selected occupations, May 1977

Occupation	Employment	Percent of total employment	Relative error (in percentage) ²	Percent of establishments reporting the occupation
TOTAL	1,318,700	100.00	-	100
MANAGERS AND OFFICERS	45,010	3.41	1	80
PROFESSIONAL OCCUPATIONS	13,670	1.00	n.a.	n.a.
Industrial engineer	2,070	.15	3	9
All other engineers	690	.05	n.a.	n.a.
Purchasing agent and/or buyer	1,780	.13	4	9
Accountant and/or auditor	2,040	.15	5	8
Personnel and labor relations specialists	850	.06	5	5
Designer	4,840	.36	5	12
All other professional workers	1,400	.10	n.a.	n.a.
TECHNICAL OCCUPATIONS	1,860	.12	n.a.	n.a.
Computer programmer	830	.06	8	3
Engineering technician	420	.03	n.a.	n.a.
Science technicians	230	.01	n.a.	n.a.
All other technicians	380	.02	n.a.	n.a.
SERVICE OCCUPATIONS	17,070	1.27	n.a.	n.a.
Janitor, porter, and/or cleaner	13,110	.99	2	40
Guard and/or doorkeeper	1,580	.11	5	4
Food service workers	150	.01	n.a.	n.a.
Supervisor, nonworking--service only	1,390	.10	8	3
All other service workers	840	.06	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	1,105,630	83.61	n.a.	n.a.
Mechanic, maintenance	1,090	.08	9	3
Mechanic, sewing machine	10,690	.81	1	34
All other mechanics and repairers	500	.03	n.a.	n.a.
Presser, hand	23,120	1.75	2	27
Presser, machine	23,450	1.77	3	22
Truck driver	2,460	.18	4	10
Supervisor, nonworking	28,730	2.17	2	44
Industrial truck operator	1,610	.12	10	3
Inspector	35,030	2.65	2	34
Instructor, apparel and textile machines	3,180	.24	4	8
Machinist	990	.07	10	4
Maintenance repairer, general utility	1,940	.14	4	8
Order filler	8,490	.64	4	12
Production packager, hand or machine	15,380	1.16	4	19
Sewing machine operator, regular equipment--garment	552,580	41.90	1	60
Sewing machine operator, special equipment and/or automatic equipment--garment	78,110	5.92	3	40
Sewing-machine operator, regular equipment- non-garment	51,420	3.89	6	13
Sewing-machine operator, special equipment and/or automatic equipment-nongarment	14,800	1.12	7	7
All-around tailor	3,320	.25	19	2
Bundler	19,300	1.46	4	33
Cap maker	3,330	.25	12	1
Cutter, portable machine	13,860	1.05	3	28
Die cutter and/or clicking-machine operator	2,250	.17	6	6
Draper	870	.06	9	2
Fusing machine operator	3,200	.24	6	6
Garment repairer	4,900	.37	4	13
Hand sewer	11,930	.90	6	11
Knitting-machine operator	1,400	.10	17	1
Belt maker, apparel	1,890	.14	15	2
Pattern cutter	1,530	.11	7	5
Patternmaker	4,200	.31	4	13
Pleating machine operator	1,720	.13	16	1
Sample maker	8,150	.61	5	15
Shaper and presser	6,100	.46	5	9
Shuttler, embroidery	1,100	.08	20	1
Slitting-machine operator	1,180	.08	9	4
Spot cleaner	1,460	.11	4	6

See footnotes at end of table.

Table 6. Apparel and other textile products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ May 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Spreader	14,410	1.09	2	30
Tester	820	.06	14	2
Thread trimmer	21,770	1.65	2	28
Work distributor	17,150	1.30	3	25
Marker	5,130	.38	3	16
Cutter, hand	8,160	.61	5	14
Turner	10,540	.79	3	22
Folder, hand	16,440	1.24	3	16
Folding machine operator	2,390	.18	10	3
Soabar operator	3,370	.25	3	12
Gluer and/or cementer, hand	1,220	.09	13	1
Cutter machine	7,840	.59	4	14
Screen or stencil printer and/or setter	1,070	.08	16	1
All other skilled craft and kindred workers	4,330	.32	n.a.	n.a.
All other operatives and semiskilled workers	18,490	1.40	n.a.	n.a.
All other laborers and unskilled workers	27,240	2.06	n.a.	n.a.
CLERICAL OCCUPATIONS				
Bookkeeping and/or billing machine operator	116,890	8.73	n.a.	n.a.
Bookkeeping and/or billing machine operator	1,650	.12	5	6
Computer operator	1,190	.09	5	5
Keypunch operator	2,280	.17	5	5
All other office machine operators	860	.06	n.a.	n.a.
Accounting clerk	3,950	.29	5	11
Bookkeeper, hand	7,080	.53	3	27
File clerk	1,310	.09	5	5
General clerk, office	14,600	1.10	4	29
Order clerk	3,500	.26	5	8
Payroll and/or timekeeping clerk	8,380	.63	2	35
Personnel clerk	1,280	.09	3	8
Procurement clerk	930	.07	6	4
Secretary	6,180	.46	3	22
Switchboard operator-receptionist	1,510	.11	3	10
Typist	1,580	.11	5	6
Clerical supervisor, office or plant	4,480	.33	5	12
All other office clerical workers	3,920	.29	n.a.	n.a.
Production clerk and/or coordinator	4,100	.31	4	11
Shipping packer	21,700	1.64	3	35
Shipping and/or receiving clerk	14,360	1.08	6	34
Stock clerk, stockroom, warehouse or storage yard	7,370	.55	4	16
Shade-ticket marker	3,300	.25	3	10
All other plant clerical workers	1,380	.10	n.a.	n.a.
SALES OCCUPATIONS				
Sales representative, sales agent, and/or sales associate	18,570	1.39	14	23
Sales representative, sales agent, and/or sales associate	15,670	1.18	4	18
Sales clerk	2,900	.21	10	4

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Lumber and Wood Products, Except Furniture

This industry group includes logging camps engaged in cutting timber and pulpwood, merchant sawmills, lath mills, shingle mills, cooperage stock mills, planing mills, plywood mills, and veneer mills which produce lumber and wood basic materials, and establishments which manufacture finished articles from wood or wood substitutes.

In 1977, the industry employed 714,000 workers or 4 percent of all workers employed in manufacturing. From 1971 to 1977, employment in the industry increased 20 percent.

The most populous occupations in the lumber and wood products industry, as shown in table 7, were: Class C assemblers, with 37,000 workers or 5 percent of total industry employment; truck drivers, 31,400 or 4 percent; and fallers and/or buckers, 22,600 or 3 percent.

The occupational distribution of employment is shown in chart 5.

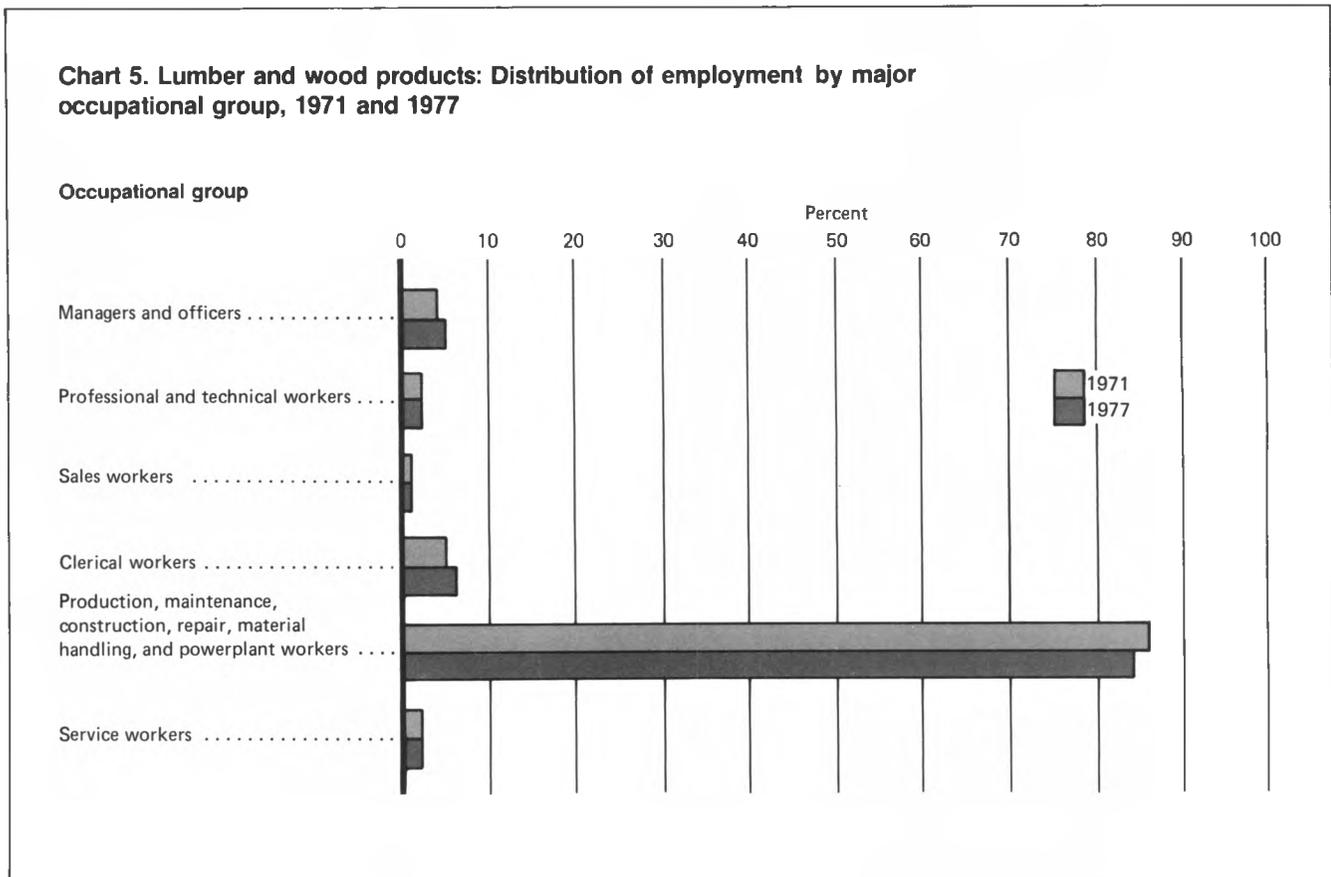


Table 7. Lumber and wood products, except furniture: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ May 1977

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
TOTAL	714,360	100.00	-	100
MANAGERS AND OFFICERS	34,630	4.84	1	65
PROFESSIONAL OCCUPATIONS	11,050	1.50	n.a.	n.a.
Industrial engineer	520	.07	6	2
All other engineers	980	.13	n.a.	n.a.
Physical scientists	50	.00	n.a.	n.a.
Agricultural scientist	870	.12	10	2
Purchasing agent and/or buyer	2,280	.31	3	10
Accountant and/or auditor	4,180	.58	3	16
Personnel and labor relations specialists	830	.11	5	4
All other professional workers	1,340	.18	n.a.	n.a.
TECHNICAL OCCUPATIONS	6,010	.81	n.a.	n.a.
Drafter	1,980	.27	4	5
All other engineering technicians	350	.04	n.a.	n.a.
Timber cruiser	2,650	.37	6	6
All other science technicians	480	.06	n.a.	n.a.
All other technicians	550	.07	n.a.	n.a.
SERVICE OCCUPATIONS	13,270	1.84	n.a.	n.a.
Janitor, porter, and/or cleaner	8,090	1.13	2	20
Guard and/or doorkeeper	3,640	.50	3	8
Food service workers	440	.06	15	1
All other service workers	1,100	.15	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	597,170	83.09	n.a.	n.a.
Mechanic, automotive	5,380	.75	3	12
Engineering-equipment mechanic	1,320	.18	8	3
Mechanic, maintenance	6,660	.93	3	12
All other mechanics and repairers	1,130	.15	n.a.	n.a.
Truck driver	31,400	4.39	1	52
Cabinetmaker	13,290	1.86	4	11
Carpenter	15,530	2.17	5	10
Crane, derrick, and/or hoist operator	1,050	.14	6	2
Delivery and/or route worker	1,480	.20	7	3
Electrician	4,500	.62	3	8
Supervisor, nonworking	22,140	3.09	1	34
Glazier	540	.07	24	1
Heavy equipment operator	5,140	.71	5	7
Industrial truck operator	18,330	2.56	2	31
Inspector	3,180	.44	5	7
Machinist	1,850	.25	5	5
Maintenance repairer, general utility	6,460	.90	3	18
Helper, trades	9,050	1.26	4	12
Millwright	3,770	.52	7	4
Oiler	1,090	.15	4	4
Order filler	1,010	.14	7	2
Plumber and/or pipefitter	1,640	.22	5	3
Production packager, hand or machine	5,780	.80	5	7
Stationary boiler firer	2,840	.39	3	5
Logging tractor operator	13,510	1.89	2	24
Welder and/or flamecutter	2,380	.33	5	5
Power-barker operator	4,620	.64	2	16
Band-scroll saw operator	820	.11	7	2
Boring-machine operator, wood	1,290	.18	6	3
Carrier driver	1,960	.27	5	4
Chain offbearer, lumber	22,210	3.10	2	17
Chaser	2,490	.34	4	4
Chipper	3,740	.52	2	13
Choker setter, lumber	5,580	.78	5	5
Automatic clipper, veneer	2,100	.29	6	3
Cut-off-saw operator, lumber	11,180	1.56	3	20
Cut-off sawyer, log	1,730	.24	5	4
Dado operator	670	.09	9	2
Bull chain operator	490	.06	7	1
Dowel machine operator	490	.06	11	1

See footnotes at end of table.

Table 7. Lumber and wood products, except furniture: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ May 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Edge gluer	1,390	0.19	8	2
Edger, automatic and/or pony	5,980	.83	2	20
Faller and/or buckler	22,570	3.15	2	25
Gang sawyer	1,160	.16	7	3
Gluing-machine operator	1,220	.17	7	2
Head loader	900	.12	7	3
Head sawyer	6,460	.90	2	23
Hook tender	1,650	.23	5	2
Hot-plate-plywood-press operator	1,710	.23	6	2
Hydraulic press operator, veneer	580	.08	15	1
Lay-out marker, wood	580	.08	9	1
Kiln operator	1,120	.15	5	4
Kiln transfer operator	590	.08	8	2
Lathe operator, wood	1,080	.15	10	1
Loader, car and truck	6,200	.86	3	12
Loader engineer	3,800	.53	3	8
Log handling equipment operator	7,710	1.07	3	19
Log inspector, grader, and/or scaler	3,960	.55	3	13
Lumber grader	5,930	.83	3	13
Lumber straightener	3,300	.46	4	7
Machine setter, woodworking	2,780	.38	4	6
Wood machinist	8,310	1.16	4	11
Nailing-machine operator	8,510	1.19	4	10
Off-bearer	17,290	2.42	3	19
Pond worker, lumber	1,200	.16	6	2
Power-screwdriver operator	1,040	.14	11	1
Resawyer	3,860	.54	3	11
Rigging slinger	1,620	.22	6	2
Ripsaw operator	6,460	.90	3	15
Rubber	1,090	.15	12	1
Sander, wood	6,130	.85	4	9
Saw filer	4,430	.62	2	14
Second loader	610	.08	10	1
Shaper and/or router operator	1,780	.24	6	3
Kiln stacker operator	1,520	.21	4	4
Tenoner operator	1,190	.16	7	3
Tester	500	.06	8	1
Transfer controller, sawmill	580	.08	6	2
Treating engineer	670	.09	9	1
Trim saw operator	6,450	.90	2	18
Variety saw operator	4,230	.59	4	9
Veneer drier	2,420	.33	7	2
Veneer grader	5,180	.72	6	3
Veneer-lathe operator	1,240	.17	6	2
Veneer repairer, machine	1,800	.25	10	1
Veneer sander	790	.11	8	2
Woodworking-machine operator	10,010	1.40	4	12
Yarder engineer	1,860	.26	6	3
Painter, production	6,440	.90	4	10
Conveyor operator or tender	780	.10	9	2
Veneer drier feeder	3,240	.45	6	2
Veneer jointer operator	640	.08	8	1
Veneer repairer, hand	2,010	.28	8	1
Core feeder	1,630	.22	8	2
Core layer and/or sheet turner	3,420	.47	6	2
Planer operator	4,080	.57	3	13
Sorter operator, green lumber	1,150	.16	7	3
Sawyer, tail	840	.11	9	2
Gluer and/or cementer, hand	1,230	.17	9	2
Assembler, class A	4,900	.68	7	5
Assembler, class B	18,790	2.63	11	9
Assembler, class C	36,910	5.16	4	14
Mixer and/or blender, chemicals and chemical - products	690	.09	7	2
All other skilled craft and kindred workers	5,790	.81	n.a.	n.a.
All other operatives and semiskilled workers	19,870	2.78	n.a.	n.a.
All other laborers and unskilled workers	63,500	8.88	n.a.	n.a.

See footnotes at end of table.

Table 7. Lumber and wood products, except furniture: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ May 1977—Continued

Occupation	Employment	Percent of total employment	Relative error (in percentage) ²	Percent of establishments reporting the occupation
CLERICAL OCCUPATIONS	42,560	5.87	n.a.	n.a.
Bookkeeping and/or billing machine operator	490	.06	6	2
Keypunch operator	580	.08	7	2
All other office machine operators	530	.07	n.a.	n.a.
Accounting clerk	2,750	.38	3	10
Bookkeeper, hand	5,190	.72	2	23
General clerk, office	7,770	1.08	2	28
Order clerk	660	.09	7	2
Payroll and/or timekeeping clerk	1,380	.19	2	8
Personnel clerk	440	.06	5	3
Receptionist	440	.06	5	3
Secretary	6,260	.87	4	24
Switchboard operator-receptionist	1,100	.15	2	6
Typist	620	.08	6	2
Clerical supervisor, office or plant	1,130	.15	9	3
All other office clerical workers	1,980	.27	n.a.	n.a.
Production clerk and/or coordinator	1,100	.15	5	4
Shipping packer	4,660	.65	4	12
Shipping and/or receiving clerk	2,150	.30	3	9
Stock clerk, stockroom, warehouse or storage yard	1,580	.22	5	5
Tally clerk, sawmill	1,320	.18	5	4
All other plant clerical workers	430	.06	n.a.	n.a.
SALES OCCUPATIONS	9,670	1.35	13	21
Sales representative, sales agent, and/or sales associate	8,880	1.24	3	19
Sales clerk	790	.11	10	2

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Furniture and Fixtures

This industry group includes establishments manufacturing household, office, public building, and restaurant furniture, and office and store fixtures.

In 1977, the industry employed 462,700 workers or 2 percent of all workers employed in manufacturing. From 1971 to 1977, employment in the industry increased 1 percent.

The most populous occupations in the furniture and fixtures industry, as shown in table 8, were: Class C assemblers, with 31,800 workers or 7 percent of total industry employment; upholsterers, 20,500; and sewing machine operators, regular—nongarment, 19,900.

The occupational distribution of employment is shown in chart 6.

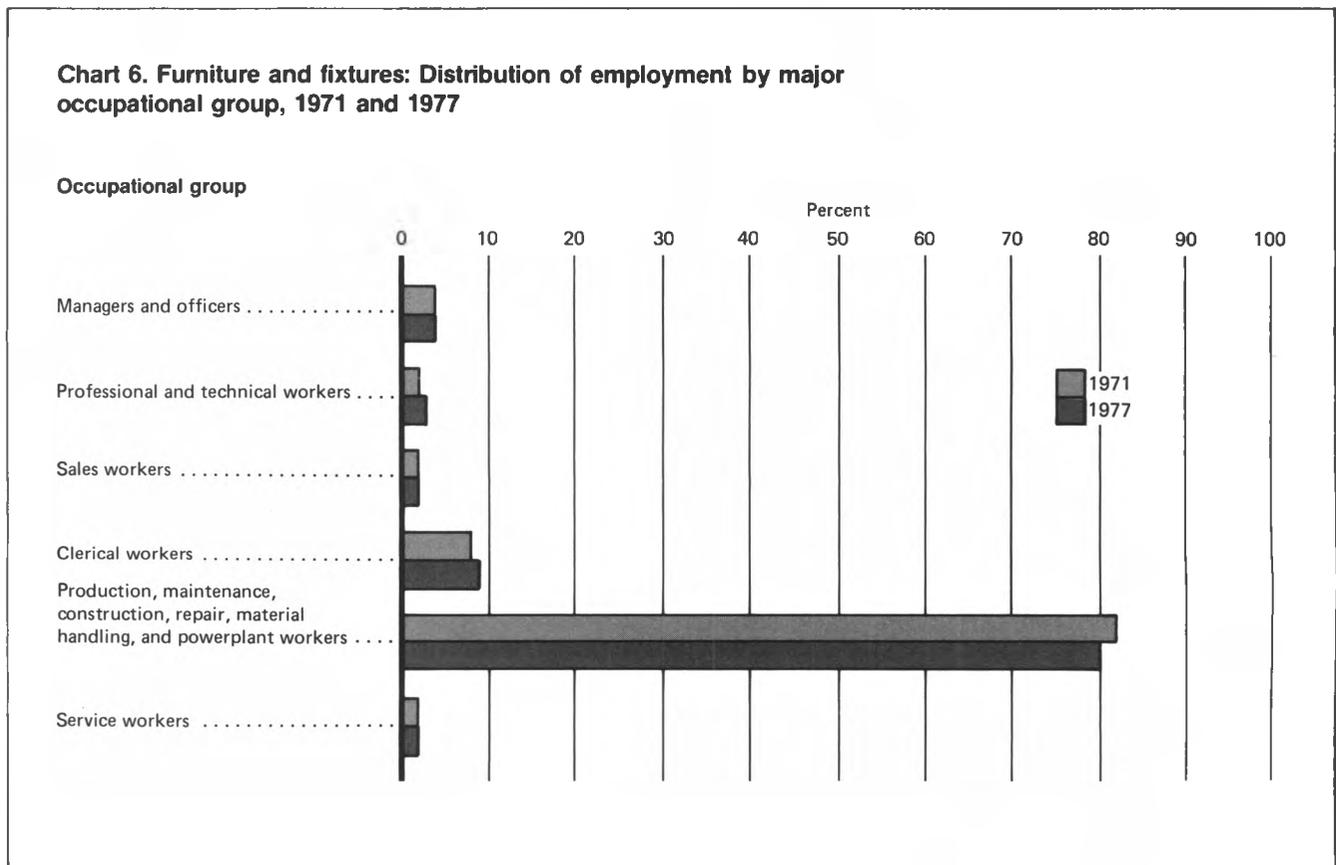


Table 8. Furniture and fixtures : Employment, relative standard error, and percent of establishments reporting selected occupations, June 1977

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
TOTAL	462,660	100.00	-	100
MANAGERS AND OFFICERS	19,500	4.21	2	91
PROFESSIONAL OCCUPATIONS	8,980	1.89	n.a.	n.a.
Industrial engineer	1,300	.28	5	12
Mechanical engineer	460	.09	10	5
All other engineers	390	.08	n.a.	n.a.
Systems analyst, electronic data processing	300	.06	9	4
Purchasing agent and/or buyer	1,750	.37	2	23
Accountant and/or auditor	2,170	.46	4	23
Personnel and labor relations specialists	750	.16	4	10
Designer	660	.14	7	7
All other professional workers	1,200	.25	n.a.	n.a.
TECHNICAL OCCUPATIONS	3,220	.67	n.a.	n.a.
Computer programmer	490	.10	9	5
Drafter	1,770	.38	5	12
All other engineering technicians	600	.12	n.a.	n.a.
All other technicians	360	.07	n.a.	n.a.
SERVICE OCCUPATIONS	7,930	1.69	n.a.	n.a.
Janitor, porter, and/or cleaner	5,140	1.11	3	38
Guard and/or doorkeeper	1,360	.29	6	7
Food service workers	120	.02	n.a.	n.a.
Supervisor, nonworking--service only	1,000	.21	11	3
All other service workers	310	.06	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	369,780	79.53	n.a.	n.a.
Mechanic, automotive	490	.10	7	5
Mechanic, maintenance	1,350	.29	7	7
All other mechanics and repairers	530	.11	n.a.	n.a.
Truck driver	7,850	1.69	3	45
Cabinetmaker	9,520	2.05	5	24
Carpenter	1,930	.41	11	8
Delivery and/or route worker	630	.13	11	4
Electrician	860	.18	6	8
Filer, grinder, buffer, chipper, cleaner, and/or polisher	1,700	.36	12	4
Supervisor, nonworking	16,340	3.53	2	51
Industrial truck operator	4,940	1.06	4	22
Inspector	5,900	1.27	4	22
Laminating-machine operator, furniture	1,700	.36	8	9
Machinist	1,310	.28	10	8
Mattress maker	3,060	.66	8	10
Maintenance repairer, general utility	2,740	.59	4	19
Helper, trades	7,230	1.56	5	23
Millwright	400	.08	14	2
Order filler	1,590	.34	7	7
Painter, maintenance	290	.06	16	2
Production packager, hand or machine	7,640	1.65	5	22
Sewing-machine operator, regular equipment- non-garment	19,870	4.29	4	32
Sewing-machine operator, special equipment and/or automatic equipment-nongarment	3,240	.70	8	13
Sheet metal worker	840	.18	18	2
Stationary boiler firer	670	.14	8	4
Tool and die maker	1,180	.25	8	6
Furniture finisher	5,730	1.23	9	12
Band-scroll saw operator	1,700	.36	4	13
Boring-machine operator, wood	2,590	.55	5	14
Wood-carving-machine operator	610	.13	12	3
Cut-off-saw operator, lumber	4,990	1.07	3	30
Dado operator	530	.11	12	4
Dowel machine operator	430	.09	8	4
Drill-press and/or boring-machine operator	790	.17	11	4
Gluing-machine operator	1,200	.25	7	8
Grinding and/or abrading machine operator, metal	1,190	.25	11	4

See footnotes at end of table.

Table 8. Furniture and fixtures : Employment, relative standard error, and percent of establishments reporting selected occupations,¹ June 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Hot-plate-plywood-press operator	400	0.08	13	3
Hydraulic press operator, veneer	430	.09	13	3
Lay-out marker, wood	790	.17	10	6
Lathe operator, wood	920	.19	7	6
Machine setter, woodworking	2,050	.44	9	8
Machine tool operator, combination	600	.12	15	2
Machine tool operator, numerical-control	280	.06	39	1
Machine tool setter, metalworking	660	.14	14	3
Wood machinist	6,620	1.43	5	27
Mortising-machine operator	380	.08	8	4
Nailing-machine operator	980	.21	9	5
Off-bearer	5,750	1.24	8	9
Patternmaker	330	.07	11	3
Plastic-top installer	1,540	.33	8	9
Plater helper	580	.12	15	2
Power-screwdriver operator	2,360	.51	11	5
Rip-and-groove-machine operator	640	.13	9	4
Ripsaw operator	4,950	1.06	4	27
Rubber	5,300	1.14	7	11
Sander, wood	12,900	2.78	5	26
Shaper, hand	1,020	.22	9	6
Shaper and/or router operator	2,870	.62	5	14
Sorter, upholstery parts	1,580	.34	8	8
Spring-machine operator	1,200	.25	15	2
Springer	4,040	.87	4	19
Stapler, mattress and bedspring	880	.19	16	3
Tenoner operator	1,530	.33	6	10
Tester	330	.07	15	2
Upholstery trimmer	3,430	.74	7	11
Variety saw operator	1,940	.41	5	13
Woodworking-machine operator	7,730	1.67	7	24
Painter, production	9,660	2.08	4	35
Riveter, light	1,310	.28	16	3
Punch-press operator, metal	7,150	1.54	7	14
Punch-press setter, metal	840	.18	11	4
Shear and/or slitter operator, metal	830	.17	10	5
Upholsterer	20,480	4.42	4	27
Upholstery cutter	6,260	1.35	4	25
Power brake and/or bending machine operator, metal	3,370	.72	9	10
Gluer and/or cementer, hand	2,440	.52	7	9
Welder and/or flamecutter -a	1,900	.41	12	7
Welder and/or flamecutter -b	3,490	.75	8	8
Welder and/or flamecutter -c	3,110	.67	10	6
Cushion maker	3,710	.80	4	17
Assembler, class A	6,220	1.34	6	16
Assembler, class B	14,990	3.23	4	27
Assembler, class C	31,760	6.86	4	32
Decorator, hand	630	.13	12	2
All other skilled craft and kindred workers	5,270	1.13	n.a.	n.a.
All other operatives and semiskilled workers	16,030	3.46	n.a.	n.a.
All other laborers and unskilled workers	31,760	6.86	n.a.	n.a.
CLERICAL OCCUPATIONS				
Bookkeeping and/or billing machine operator	630	.13	5	8
Computer operator	620	.13	6	7
Keypunch operator	1,060	.22	5	7
All other office machine operators	330	.07	n.a.	n.a.
Stenographer	450	.09	9	4
Accounting clerk	2,000	.43	4	19
Bookkeeper, hand	2,500	.54	3	32
File clerk	620	.13	6	7
General clerk, office	5,450	1.17	3	42
Order clerk	1,850	.39	4	14
Payroll and/or timekeeping clerk	1,570	.33	4	19
Personnel clerk	540	.11	5	8
Procurement clerk	620	.13	4	9

See footnotes at end of table.

Table 8. Furniture and fixtures : Employment, relative standard error, and percent of establishments reporting selected occupations,¹ June 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
CLERICAL OCCUPATIONS—Continued				
Secretary	4,320	0.93	3	40
Switchboard operator-receptionist	960	.20	3	17
Typist	1,630	.35	7	10
Clerical supervisor, office or plant	1,040	.22	7	8
All other office clerical workers	2,120	.45	n.a.	n.a.
Production clerk and/or coordinator	1,970	.42	5	15
Shipping packer	6,270	1.35	4	33
Shipping and/or receiving clerk	4,190	.90	3	40
Stock clerk, stockroom, warehouse or storage yard	1,990	.43	6	14
All other plant clerical workers	460	.09	n.a.	n.a.
SALES OCCUPATIONS	10,060	2.16	17	39
Sales representative, sales agent, and/or sales associate	9,620	2.07	4	37
Sales clerk	440	.09	14	3

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Paper and Allied Products

This industry group includes establishments which manufacture pulps from wood and other cellulose fibers, and from rags; manufacture paper and paperboard; and manufacture converted products such as paper coated off the paper machine, paper boxes, and envelopes.

In 1977, the industry employed 686,100 workers or 4 percent of all workers employed in manufacturing. From 1971 to 1977, employment in the industry increased 1 percent.

The most populous occupations in the paper industry, as shown in table 9, were: Nonworking supervisors in production and related work, with 30,000 workers or 4 percent of total industry employment; production packagers (hand or machine), 26,700; and industrial truck operators, 21,100.

The occupational distribution of employment is shown in chart 7.

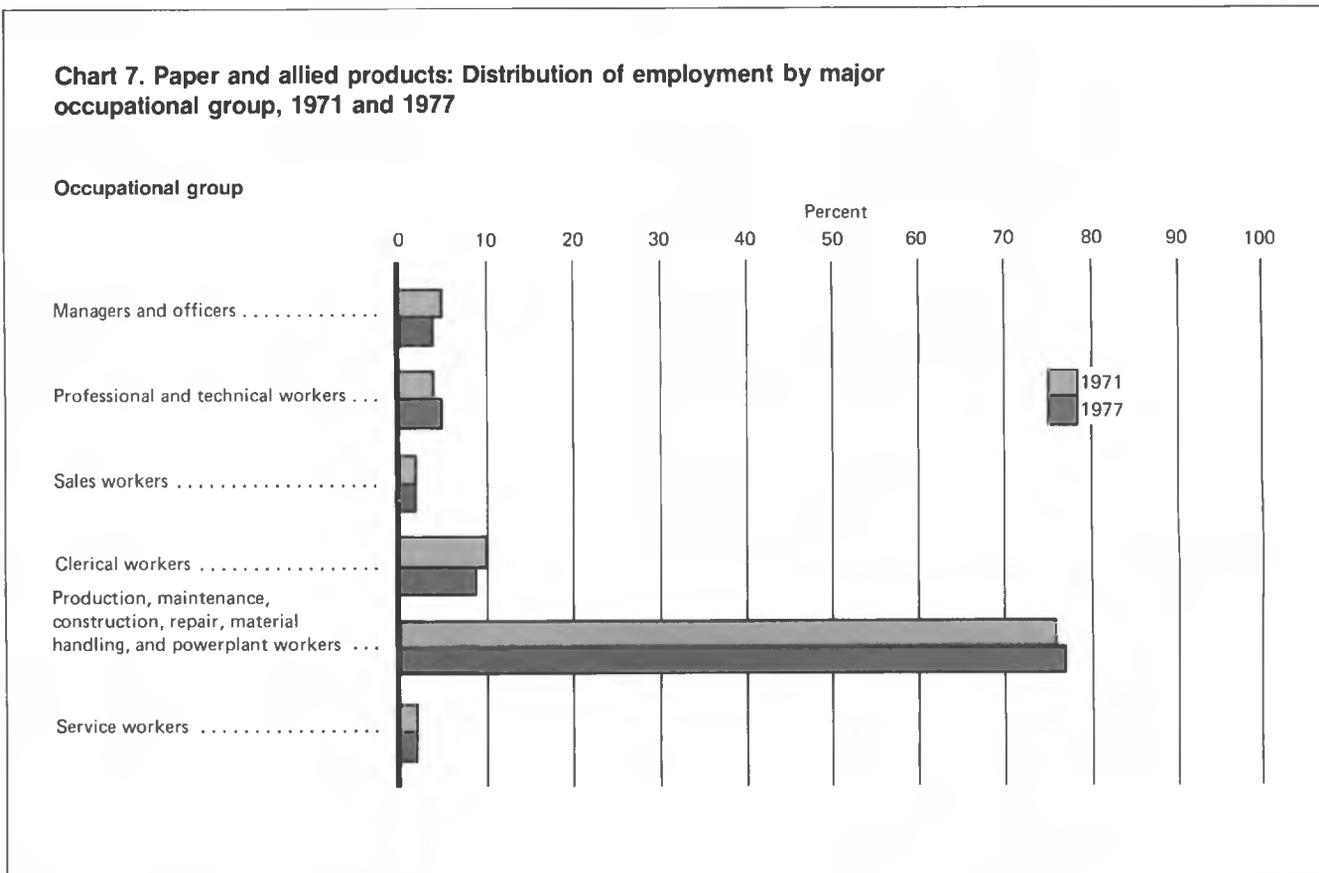


Table 9. Paper and allied products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ April 1977

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
TOTAL	686,140	100.00	-	100
MANAGERS AND OFFICERS	33,000	4.80	2	86
PROFESSIONAL OCCUPATIONS	23,050	3.26	n.a.	n.a.
Chemical engineer	1,330	.19	5	7
Electrical and/or electronic engineer	680	.09	5	7
Industrial engineer	1,300	.18	5	15
Mechanical engineer	2,460	.35	5	15
All other engineers	900	.13	n.a.	n.a.
Mathematical scientist	60	.00	n.a.	n.a.
Chemist	1,440	.20	10	7
All other physical scientists	170	.02	n.a.	n.a.
Life scientist	240	.03	n.a.	n.a.
Systems analyst, electronic data processing	720	.10	9	6
Purchasing agent and/or buyer	2,650	.38	3	32
Accountant and/or auditor	4,360	.63	3	33
Commercial artist	990	.14	8	8
Nurse,professional	660	.09	5	7
Personnel and labor relations specialists	1,960	.28	3	22
Designer	1,040	.15	7	13
All other professional workers	2,090	.30	n.a.	n.a.
TECHNICAL OCCUPATIONS	5,610	.78	n.a.	n.a.
Computer programmer	740	.10	6	8
Drafter	820	.11	7	8
All other engineering technicians	1,570	.22	n.a.	n.a.
Science technicians	1,320	.19	12	3
All other technicians	1,160	.16	n.a.	n.a.
SERVICE OCCUPATIONS	11,630	1.67	n.a.	n.a.
Janitor, porter, and/or cleaner	7,390	1.07	3	43
Guard and/or doorkeeper	2,230	.32	5	10
Food service workers	160	.02	n.a.	n.a.
Supervisor,nonworking--service only	1,200	.17	13	5
All other service workers	650	.09	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	531,640	76.88	n.a.	n.a.
Mechanic, automotive	1,620	.23	6	12
Mechanic, maintenance	11,330	1.65	5	27
All other mechanics and repairers	1,530	.22	n.a.	n.a.
Truck driver	9,440	1.37	3	45
Carpenter	1,350	.19	7	7
Compositor and/or typesetter	640	.09	10	6
Crane, derrick, and/or hoist operator	1,670	.24	8	5
Delivery and/or route worker	570	.08	14	4
Electrician	7,230	1.05	3	21
Supervisor, nonworking	30,040	4.37	2	58
Heavy equipment operator	1,390	.20	11	4
Industrial truck operator	21,110	3.07	3	48
Inspector	6,500	.94	6	14
Instrument repairer	2,410	.35	4	8
Machinist	5,280	.76	7	19
Maintenance repairer, general utility	7,460	1.08	6	27
Helper, trades	3,230	.47	9	9
Millwright	8,970	1.30	5	10
Oiler	2,810	.40	4	15
Order filler	3,030	.44	8	11
Painter, maintenance	1,450	.21	11	7
Plumber and/or pipefitter	4,790	.69	4	7
Press operator and/or plate printer	13,680	1.99	5	24
Production packager, hand or machine	26,750	3.89	5	32
Scrapper and/or stripper, hand or machine	4,400	.64	6	13
Sheet metal worker	450	.06	12	2
Stationary boiler firer	3,080	.44	6	11
Stationary engineer	2,000	.29	8	7
Tool and die maker	430	.06	11	3
Welder and/or flamecutter	2,670	.38	7	8

See footnotes at end of table.

Table 9. Paper and allied products: Employment, relative standard error, and percent of establishments reporting selected occupations, April 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Automatic-assembly-machine attendant	1,530	0.22	17	2
Back tender	5,820	.84	4	12
Bag-machine operator	7,390	1.07	10	7
Bag sewer	1,350	.19	15	2
Power-barker operator	560	.08	9	3
Beater engineer	2,490	.36	4	9
Beater	2,820	.41	5	8
Bleacher operator, pulp	1,200	.17	9	3
Bottoming-machine operator, paper-bag-press operator, and/or valving machine operator	1,510	.22	14	2
Box maker, paperboard	2,760	.40	13	7
Carton-forming-machine operator	3,760	.54	6	12
Chemical operator A	860	.12	6	3
Chemical operator B	730	.10	8	3
Chemical operator helper	630	.09	9	2
Chipper	1,060	.15	9	3
Coater operator, off-machine	2,980	.43	10	6
Coating mixer tender	1,280	.18	9	4
Combiner operator	1,510	.22	11	6
Convolute-tube and/or spiral-tube winder	2,000	.29	10	5
Corner cutter	750	.10	8	6
Corrugator-knife operator	1,440	.20	5	11
Corrugator operator	3,540	.51	6	14
Box cover stripper	450	.06	15	3
Cut-off-machine operator, tubing	1,080	.15	12	3
Cutting-and-creasing press operator	4,350	.63	6	16
Cylinder-machine tender	1,060	.15	9	3
Decker operator	650	.09	7	3
Die cutter and/or clicking-machine operator	5,900	.85	6	20
Die maker	1,460	.21	6	11
Die moulder	1,380	.20	5	15
Digester operator	1,240	.18	8	4
Digester-operator helper	1,300	.18	6	3
Ending-machine operator	700	.10	13	4
Envelope-machine operator	6,820	.99	9	4
Etcher and/or engraver	700	.10	9	4
Evaporator operator, papermaking	660	.09	8	3
Flexo-folder-gluer operator	2,660	.38	5	11
Folding-machine feeder	950	.13	13	3
Folding-machine operator, paper	3,810	.55	13	4
Four-corners-stayer-machine operator	690	.10	10	5
Fourdrinier-machine tender	4,520	.65	4	9
Wood grinder operator	920	.13	13	2
Layboy tender	1,000	.14	10	3
Log inspector, grader, and/or scaler	880	.12	13	3
Envelope-finishing-machine operator	900	.13	19	2
Machine setter, paper goods	9,710	1.41	5	17
Panel-machine operators, patch-machine operators, and/or sealing-machine operators	750	.10	22	2
Paper-cup-machine operator	820	.11	29	1
Paper-reel operator and/or rewinder operator	5,430	.79	6	11
Power-press tender	970	.14	16	3
Printer-slotter operator	4,160	.60	4	19
Printer-slotter feeder	4,010	.58	4	16
Process-machine operators, gummed tape and/or tightening-machine operators	490	.07	38	1
Pulp-refiner operator	910	.13	8	3
Pulper	3,150	.45	5	8
Recovery operator, papermaking	1,360	.19	8	3
Ruling-machine operator	580	.08	18	1
Scorer	1,110	.16	6	9
Slitter-creaser-slotter operator	1,670	.24	6	12
Slitter-scorer-cut-off operator	1,320	.19	7	9
Slitting-machine operator	6,880	1.00	8	21
Slotter operator	1,170	.17	7	10
Stapling-machine operator	1,830	.26	9	10
Supercalender operator	1,060	.15	11	3

See footnotes at end of table.

Table 9. Paper and allied products: Employment, relative standard error, and percent of establishments reporting selected occupations, April 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Taping-machine operator	3,330	0.48	4	19
Tester	6,220	.90	4	12
Tube-machine operator, bags	1,290	.18	13	2
Waxing-machine operator	1,410	.20	14	7
Wet-machine tender	970	.14	11	3
Winder, paper machine	5,650	.82	3	12
Wrapping-machine operator	2,260	.32	9	6
Punch-press operator, metal	860	.12	22	2
Conveyor operator or tender	2,220	.32	9	8
Brown-stock washer and/or blow-pit operator	880	.12	8	3
Fourth hand and/or fifth hand, paper machine	7,380	1.07	4	10
Stringing-machine operators and/or tape-fastener-machine operators	470	.06	24	1
Stripping-machine operator	520	.07	21	2
Baling-machine operator	4,350	.63	3	36
Cutter machine	6,910	1.00	5	21
Screen or stencil printer and/or setter	560	.08	30	2
Embossing, stamping, and/or marking machine - operator	1,600	.23	15	5
Bindery worker, assembly	1,450	.21	22	2
All other bindery workers	1,020	.14	n.a.	n.a.
Extruder operator, plastics or rubber	2,540	.37	13	4
Extruder operator helper, plastics or rubber	1,270	.18	17	2
Assembler, class A	1,860	.27	38	1
Assembler, class B	4,370	.63	19	3
Assembler, class C	8,760	1.27	10	8
Mixer and/or blender, chemicals and chemical - products	1,780	.25	8	10
All other skilled craft and kindred workers	9,510	1.38	n.a.	n.a.
All other operatives and semiskilled workers	49,270	7.17	n.a.	n.a.
All other laborers and unskilled workers	76,190	11.10	n.a.	n.a.
CLERICAL OCCUPATIONS	65,730	9.45	n.a.	n.a.
Bookkeeping and/or billing machine operator	1,270	.18	5	15
Computer operator	1,130	.16	4	14
Keypunch operator	1,710	.24	4	13
All other office machine operators	640	.09	n.a.	n.a.
Stenographer	1,270	.18	7	9
Accounting clerk	4,700	.68	3	32
Bookkeeper, hand	1,520	.22	5	20
File clerk	910	.13	7	10
General clerk, office	5,180	.75	5	30
Order clerk	3,580	.52	5	24
Payroll and/or timekeeping clerk	2,590	.37	2	34
Personnel clerk	1,130	.16	4	16
Procurement clerk	730	.10	5	10
Receptionist	440	.06	8	6
Secretary	7,720	1.12	3	46
Statistical clerk	810	.11	6	9
Switchboard operator-receptionist	2,100	.30	3	36
Typist	2,720	.39	5	21
Clerical supervisor, office or plant	2,140	.31	6	17
Box estimator, paperboard products	1,730	.25	4	19
All other office clerical workers	2,360	.34	n.a.	n.a.
Production clerk and/or coordinator	3,990	.58	3	33
Shipping packer	4,000	.58	6	19
Shipping and/or receiving clerk	5,740	.83	3	47
Weigher, record-keeping	580	.08	12	3
Stock clerk, stockroom, warehouse or storage yard	3,410	.49	5	22
All other plant clerical workers	1,630	.23	n.a.	n.a.
SALES OCCUPATIONS	15,480	2.25	13	57
Sales representative, sales agent, and/or sales associate	14,970	2.18	3	52
Sales clerk	510	.07	10	5

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Printing and Publishing

This industry group includes establishments engaged in letterpress, lithography, gravure, or screen printing; and establishments which perform services for the printing trade, such as bookbinding, typesetting, engraving, photoengraving, and electrotyping. This group also includes establishments engaged in publishing newspapers, books, and periodicals, whether or not they do their own printing.

In 1977, the industry employed 1.1 million workers

or 6 percent of all workers employed in manufacturing. From 1971 to 1977, employment in the industry increased 1 percent.

The most populous occupations in the printing and publishing industry, as shown in table 10, were: Sales representatives-agents-associates, with 65,600 workers or 6 percent of total industry employment; sheet, roll, or web-fed offset lithographic press operators, 65,000; and reporters and correspondents, 40,700.

Table 10. Printing and publishing: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ May 1977

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
TOTAL	1,132,880	100.00	-	100
MANAGERS AND OFFICERS	97,070	8.56	2	86
PROFESSIONAL OCCUPATIONS	116,150	10.17	n.a.	n.a.
Engineers	1,460	.12	n.a.	n.a.
Mathematical scientist	500	.04	n.a.	n.a.
Physical scientists	200	.01	n.a.	n.a.
Social scientist	210	.01	n.a.	n.a.
Systems analyst, electronic data processing	1,630	.14	16	2
Photographer	4,770	.42	3	6
Purchasing agent and/or buyer	2,240	.19	3	7
Accountant and/or auditor	3,990	.35	4	9
Commercial artist	9,850	.86	4	11
Writer and/or editor	39,740	3.50	3	27
Librarian, professional	1,200	.10	6	2
Personnel and labor relations specialists	1,290	.11	4	4
Reporter and/or correspondent	40,670	3.59	3	16
Designer	1,290	.11	12	1
Estimator, printing services	3,580	.31	4	8
All other professional workers	3,530	.31	n.a.	n.a.
TECHNICAL OCCUPATIONS	5,280	.44	n.a.	n.a.
Computer programmer	2,550	.22	8	4
Electrical and/or electronic technician	860	.07	14	1
All other engineering technicians	930	.08	n.a.	n.a.
Science technicians	80	.00	n.a.	n.a.
All other technicians	860	.07	n.a.	n.a.
SERVICE OCCUPATIONS	19,250	1.66	n.a.	n.a.
Janitor, porter, and/or cleaner	15,390	1.35	3	26
Guard and/or doorkeeper	1,350	.11	9	1
Food service workers	550	.04	n.a.	n.a.
Supervisor, nonworking--service only	1,240	.10	10	2
All other service workers	720	.06	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	582,510	51.11	n.a.	n.a.
Mechanic, maintenance	2,810	.24	6	4
All other mechanics and repairers	1,120	.09	n.a.	n.a.
Developer and/or projection printer	1,450	.12	8	3
Truck driver	9,680	.85	22	6
Delivery and/or route worker	24,800	2.18	6	24
Electrician	1,560	.13	8	2
Supervisor, nonworking	20,930	1.84	4	24

See footnotes at end of table.

Table 10. Printing and publishing: Employment, relative standard error, and percent of establishments reporting selected occupations, May 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Industrial truck operator	4,290	.37	8	3
Inspector	4,050	.35	8	3
Machinist	2,360	.20	9	2
Maintenance repairer, general utility	3,660	.32	4	6
Helper, trades	940	.08	11	1
Order filler	4,440	.39	11	2
Production packager, hand or machine	10,760	.94	7	4
Offset lithographic press operator, sheet, roll or web fed	65,010	5.73	1	52
Platemaker	11,580	1.02	2	23
Stripper	19,100	1.68	2	24
Camera operator, printing	18,440	1.62	2	41
Strike-on-machine operator	1,990	.17	9	3
Photolettering machine operator	1,750	.15	10	3
Etcher and/or engraver	1,300	.11	11	1
Conveyor operator or tender	680	.06	31	1
Copy marker	3,730	.32	6	5
Copy cutter	890	.07	9	1
Hand compositor	12,050	1.06	6	15
Imposer and makeup arranger	9,000	.79	5	12
Line casting machine operator	9,560	.84	4	14
Linecasting-machine keyboard operator	8,950	.79	9	8
Linecasting-machine tender	1,940	.17	7	4
Monotype-keyboard operator	900	.07	14	1
Pasteup man/woman	21,540	1.90	3	14
Phototypesetting-machine-keyboard operator	9,810	.86	5	9
Phototypesetting-machine monitor	2,190	.19	7	4
Phototypesetter operator	3,960	.34	6	6
Proofreader, composed copy	15,860	1.40	3	23
Retoucher	3,040	.26	7	4
Photoengraver	8,100	.71	7	8
Stereotyper	1,200	.10	15	1
Flexographic press operator	1,990	.17	11	1
Gravure press operator, rotogravure or sheet fed	2,190	.19	16	1
Ink worker	900	.07	11	2
Letter press operator, sheet, roll or web fed	32,440	2.86	4	28
Letterset press operator, sheet, roll or web fed	1,120	.09	12	1
Proof press operator	1,160	.10	10	2
Steel die press operator	1,500	.13	12	1
Press assistants and feeders	24,100	2.12	3	17
Setter, bindery machines	5,700	.50	6	7
Mailer	22,070	1.94	5	13
Cutter machine	5,820	.51	4	8
Screen or stencil printer and/or setter	3,120	.27	11	2
Bookbinder, hand	5,300	.46	8	5
Bookbinder, machine	14,530	1.28	5	13
Bindery worker, assembly	31,420	2.77	4	21
Bindery worker, stitching	9,080	.80	6	10
All other bindery workers	26,080	2.30	n.a.	n.a.
All other skilled craft and kindred workers	9,630	.85	n.a.	n.a.
All other operatives and semiskilled workers	21,490	1.89	n.a.	n.a.
All other laborers and unskilled workers	37,450	3.30	n.a.	n.a.
CLERICAL OCCUPATIONS				
Addressing machine operator	239,570	20.98	n.a.	n.a.
Bookkeeping and/or billing machine operator	1,300	.11	10	2
Computer operator	2,230	.19	5	5
Keypunch operator	3,270	.28	6	5
Peripheral EDP equipment operator	4,890	.43	6	5
Inserting and/or labeling machine operator	1,130	.09	22	1
All other office machine operators	1,790	.15	18	1
Stenographer	1,960	.17	n.a.	n.a.
Accounting clerk	2,060	.18	10	2
Bookkeeper, hand	12,210	1.07	3	21
Cashier	13,070	1.15	2	37
File clerk	1,110	.09	8	2
General clerk, office	3,800	.33	6	5
Order clerk	39,150	3.45	5	39
	8,400	.74	7	5

See footnotes at end of table.

Table 10. Printing and publishing: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ May 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
CLERICAL OCCUPATIONS—Continued				
Payroll and/or timekeeping clerk	2,740	.24	3	8
Personnel clerk	1,040	.09	5	4
Receptionist	1,540	.13	6	4
Secretary	27,730	2.44	3	40
Statistical clerk	1,210	.10	9	2
Switchboard operator	2,040	.18	5	3
Switchboard operator-receptionist	3,240	.28	2	11
Messenger	8,040	.70	17	6
Typist	18,730	1.65	3	24
Clerical supervisor, office or plant	6,210	.54	7	5
Circulation clerk	9,360	.82	7	7
Classified-ad clerk, newspaper	3,010	.26	5	4
Customer service representative, printing and - publishing	5,940	.52	5	6
Telephone ad-taker, newspaper	8,440	.74	5	5
All other office clerical workers	12,370	1.09	n.a.	n.a.
Production clerk and/or coordinator	5,330	.47	5	7
Shipping packer	6,820	.60	6	6
Shipping and/or receiving clerk	12,950	1.14	3	26
Stock clerk, stockroom, warehouse or storage yard	3,370	.29	7	6
All other plant clerical workers	3,090	.27	n.a.	n.a.
SALES OCCUPATIONS	73,050	6.43	n.a.	n.a.
Sales representative, sales agent, and/or sales associate	65,640	5.79	2	49
Sales clerk	1,530	.13	9	2
All other sales workers	5,880	.51	n.a.	n.a.

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Chemicals and Allied Products

This industry group includes establishments manufacturing basic chemicals and products by predominantly chemical processes.

In 1977, the industry employed 1.1 million workers or 6 percent of all workers employed in manufacturing. From 1971 to 1977, employment in the industry increased 6 percent.

The most populous occupations in the chemical in-

dustry, as shown in table 11, were: Sales representatives-agents-associates, with 53,700 workers or 5 percent of total industry employment; nonworking supervisors for production and other blue-collar occupations, 49,700; production packagers (hand or machine), 47,600; and chemical operators, A, 45,600.

The occupational distribution of employment is shown in chart 8.

Chart 8. Chemicals and allied products: Distribution of employment by major occupational group, 1971 and 1977

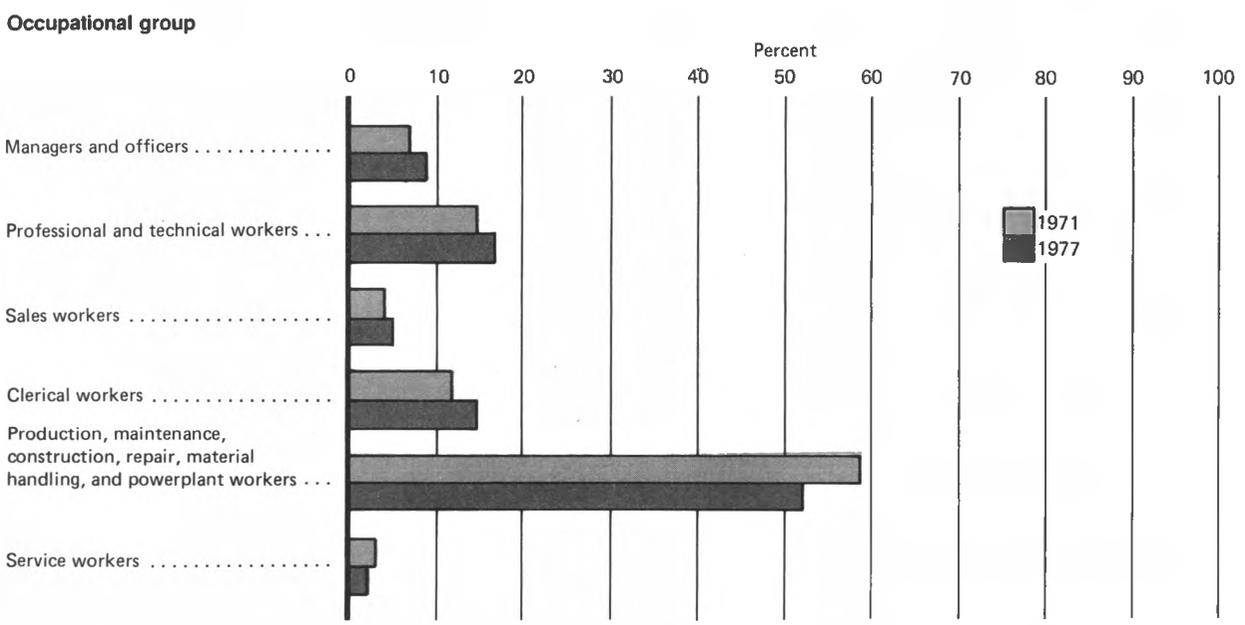


Table 11. Chemicals and allied products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ June 1977

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
TOTAL	1,081,980	100.00	-	100
MANAGERS AND OFFICERS	96,960	8.96	4	55
PROFESSIONAL OCCUPATIONS	124,540	11.40	n.a.	n.a.
Chemical engineer	18,100	1.67	9	13
Civil engineer	1,210	.11	22	2
Electrical and/or electronic engineer	2,830	.26	12	5
Industrial engineer	2,480	.22	8	5
Mechanical engineer	7,540	.69	10	9
Safety engineer	1,300	.12	5	6
All other engineers	3,920	.36	n.a.	n.a.
Statistician	870	.08	15	2
All other mathematical scientists	580	.05	n.a.	n.a.
Chemist	31,970	2.95	5	30
All other physical scientists	1,450	.13	n.a.	n.a.
Agricultural scientist	690	.06	26	1
Biological scientist	6,170	.57	12	3
Medical scientist	1,170	.10	15	1
All other life scientists	2,760	.25	n.a.	n.a.
Systems analyst, electronic data processing	4,750	.43	12	5
Purchasing agent and/or buyer	5,190	.47	4	15
Accountant and/or auditor	11,330	1.04	7	18
Writer and/or editor	920	.08	10	2
Lawyer	1,760	.16	23	2
Nurse,professional	1,380	.12	5	5
Personnel and labor relations specialists	3,940	.36	5	10
Designer	790	.07	10	2
All other professional workers	11,440	1.05	n.a.	n.a.
TECHNICAL OCCUPATIONS	54,750	5.04	n.a.	n.a.
Computer programmer	3,510	.32	11	6
Drafter	3,480	.32	17	6
Electrical and/or electronic technician	1,530	.14	13	2
All other engineering technicians	7,730	.71	n.a.	n.a.
Physical science technician	14,860	1.37	10	5
Biological science technician	7,490	.69	10	4
All other science technicians	11,050	1.02	n.a.	n.a.
All other technicians	5,100	.47	n.a.	n.a.
SERVICE OCCUPATIONS	25,740	2.36	n.a.	n.a.
Janitor, porter, and/or cleaner	13,920	1.28	5	20
Guard and/or doorkeeper	5,870	.54	8	5
Food service workers	1,460	.13	16	1
Supervisor,nonworking--service only	1,560	.14	13	3
All other service workers	2,930	.27	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR,MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	564,030	51.76	n.a.	n.a.
Mechanic, automotive	2,380	.21	8	4
Mechanic, maintenance	25,630	2.36	5	13
Refrigeration mechanic and/or air conditioning - mechanic	1,050	.09	12	2
All other mechanics and repairers	4,010	.37	n.a.	n.a.
Truck driver	11,790	1.08	4	21
Asbestos and insulation worker	960	.08	21	1
Boilermaker	810	.07	24	1
Carpenter	2,930	.27	7	5
Crane, derrick, and/or hoist operator	1,390	.12	14	2
Delivery and/or route worker	1,240	.11	17	2
Extractor operator and/or extractor plant operator ..	1,040	.09	20	1
Electrician	10,950	1.01	5	10
Supervisor, nonworking	49,700	4.59	3	30
Rigger	1,100	.10	15	1
Industrial truck operator	14,400	1.33	4	17
Inspector	9,540	.88	9	6
Instrument repairer	6,420	.59	6	6
Loader,tank cars and/or trucks	3,760	.34	8	5
Machinist	7,510	.69	7	8

See footnotes at end of table.

Table 11. Chemicals and allied products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ June 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Maintenance repairer, general utility	15,830	1.46	6	19
Helper, trades	3,590	.33	9	4
Millwright	5,010	.46	15	2
Oiler	1,120	.10	8	3
Order filler	7,170	.66	6	9
Painter, maintenance	2,540	.23	8	5
Plumber and/or pipefitter	8,970	.82	8	4
Press operator and/or plate printer	880	.08	17	2
Production packager, hand or machine	47,570	4.39	5	22
Sheet metal worker	1,490	.13	9	2
Stationary boiler firer	2,130	.19	8	3
Stationary engineer	3,930	.36	7	4
Animal caretaker	1,400	.12	17	1
Welder and/or flamecutter	4,320	.39	9	5
Ampule filling, sealing and/or washing operators	1,660	.15	17	1
Beam-warper tender, automatic and/or beamer	2,910	.26	17	0
Bobbin sorter	670	.06	26	0
Carbon black maker	940	.08	26	0
Chemical operator A	45,570	4.21	5	13
Chemical operator B	20,700	1.91	7	8
Chemical operator helper	15,460	1.42	6	9
Coater, pill	680	.06	19	1
Compressor, tablet	940	.08	15	1
Creeler, yarn	3,070	.28	17	0
Doffer	2,580	.23	31	0
Draw machine operator	9,300	.85	15	0
Evaporator operator, chemical	920	.08	20	1
Furnace and/or burner tender	960	.08	21	1
Granulator machine operator	890	.08	16	1
Kettle operator, adhesive	1,330	.12	17	1
Sampler and/or test preparer	740	.06	17	1
Spinner, synthetic filaments	11,700	1.08	13	1
Still operator, batch or continuous	3,620	.33	31	1
Tester	6,240	.57	9	5
Twister tender	2,020	.18	23	0
Texturizer and/or crimp setter	3,250	.30	30	0
Yarn winder	1,650	.15	26	0
Conveyor operator or tender	1,880	.17	24	1
Drier operator, chemicals, plastic resins, and rubber	2,610	.24	15	2
Chief operator	10,120	.93	7	6
Waste treatment plant operator, chemicals	1,760	.16	8	3
Electrolytic cell maker and/or repairer	1,010	.09	24	0
Staple cutter	1,780	.16	28	0
Weigher, production	2,140	.19	11	3
Cutter machine	710	.06	34	0
Grinder operator, chemicals, plastics, rubber, and related materials	7,440	.68	7	8
Calender operator, plastics or rubber	730	.06	18	0
Extruder operator, plastics or rubber	2,010	.18	15	1
Filter and/or filter press operator	2,030	.18	13	2
Pump operator	1,420	.13	12	2
Tinter	3,000	.27	6	7
Mixer and/or blender, chemicals and chemical products	24,600	2.27	4	26
All other skilled craft and kindred workers	12,290	1.13	n.a.	n.a.
All other operatives and semiskilled workers	48,510	4.48	n.a.	n.a.
All other laborers and unskilled workers	39,630	3.66	n.a.	n.a.
CLERICAL OCCUPATIONS	160,600	14.70	n.a.	n.a.
Bookkeeping and/or billing machine operator	830	.07	9	3
Computer operator	2,860	.26	6	7
Keypunch operator	4,580	.42	6	8
All other office machine operators	2,120	.19	n.a.	n.a.
Stenographer	5,060	.46	7	6
Accounting clerk	13,330	1.23	5	21
Bookkeeper, hand	2,260	.20	6	11

See footnotes at end of table.

Table 11. Chemicals and allied products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ June 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
CLERICAL OCCUPATIONS—Continued				
File clerk	2,120	0.19	9	5
General clerk, office	18,380	1.69	8	24
Order clerk	7,770	.71	6	15
Payroll and/or timekeeping clerk	2,480	.22	4	11
Personnel clerk	1,940	.17	5	8
Procurement clerk	1,500	.13	6	5
Receptionist	770	.07	9	3
Secretary	34,680	3.20	7	36
Statistical clerk	1,100	.10	16	3
Switchboard operator	890	.08	6	4
Switchboard operator-receptionist	2,010	.18	3	12
Typist	8,880	.82	5	16
Clerical supervisor, office or plant	6,330	.58	12	9
All other office clerical workers	9,790	.90	n.a.	n.a.
Production clerk and/or coordinator	4,860	.44	7	9
Shipping packer	7,730	.71	7	13
Shipping and/or receiving clerk	8,290	.76	5	22
Stock clerk, stockroom, warehouse or storage yard	7,270	.67	5	14
All other plant clerical workers	2,770	.25	n.a.	n.a.
SALES OCCUPATIONS	55,360	5.11	18	30
Sales representative, sales agent, and/or sales associate	53,670	4.96	4	28
Sales clerk	1,690	.15	14	2

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Petroleum and Coal Products

This industry group includes establishments refining petroleum, manufacturing paving and roofing materials, and compounding lubricating oils and greases from purchased materials.

In 1977, the industry employed 202,800 workers or 1 percent of all workers employed in manufacturing. From 1971 to 1977, employment in the industry increased 6 percent.

The most populous occupations in the petroleum and coal industry, as shown in table 12, were: Refinery operators, with 13,500 workers or 7 percent of total industry employment; and nonworking supervisors for production and other blue-collar occupations, 10,400.

The occupational distribution of employment is shown in chart 9.



Chart 9. Petroleum and coal products: Distribution of employment by major occupational group, 1971 and 1977

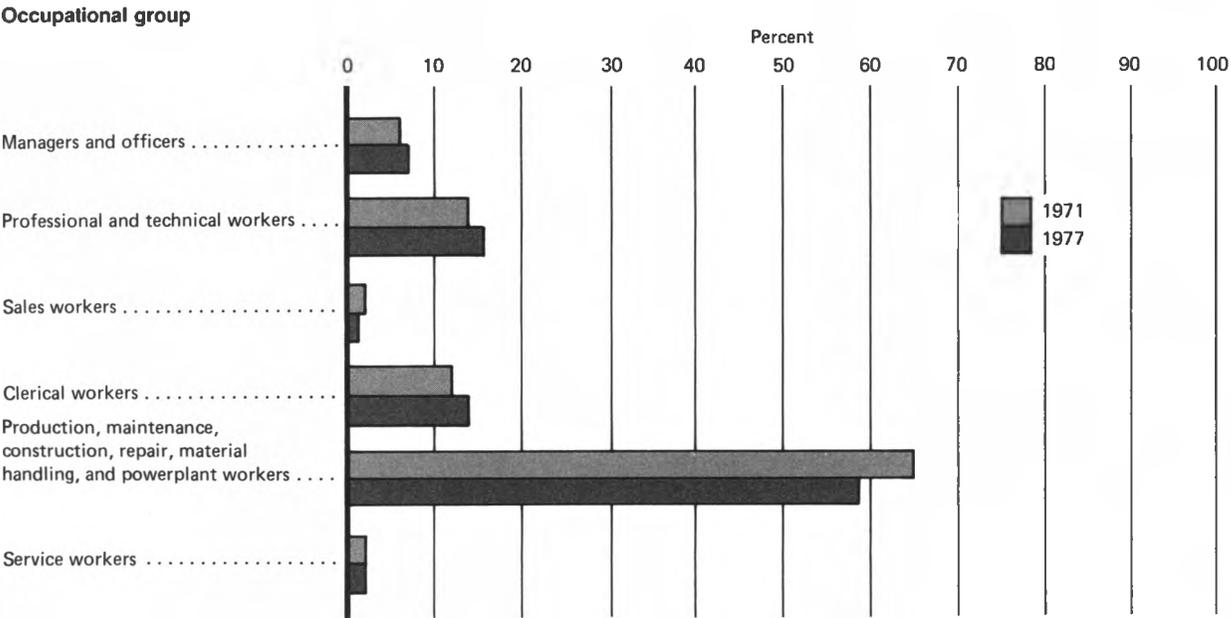


Table 12. Petroleum and coal products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ May 1977

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
TOTAL	202,830	100.00	-	100
MANAGERS AND OFFICERS	13,580	6.69	11	94
PROFESSIONAL OCCUPATIONS	25,090	12.24	n.a.	n.a.
Chemical engineer	3,740	1.84	12	17
Civil engineer	990	.48	32	10
Electrical and/or electronic engineer	630	.31	19	10
Industrial engineer	400	.19	23	8
Mechanical engineer	1,880	.92	13	18
Petroleum engineer	850	.41	26	4
Safety engineer	420	.20	10	13
All other engineers	1,420	.69	n.a.	n.a.
Statistician	310	.15	31	3
All other mathematical scientists	380	.18	n.a.	n.a.
Chemist	3,560	1.75	17	29
Geologist and/or geophysicist	570	.28	40	2
All other physical scientists	90	.04	n.a.	n.a.
Life scientist	80	.03	n.a.	n.a.
Systems analyst, electronic data processing	1,450	.71	33	9
Purchasing agent and/or buyer	720	.35	7	30
Accountant and/or auditor	2,880	1.41	22	30
Lawyer	350	.17	29	4
Nurse, professional	200	.09	12	7
Personnel and labor relations specialists	950	.46	17	19
All other professional workers	3,220	1.58	n.a.	n.a.
TECHNICAL OCCUPATIONS	8,200	4.01	n.a.	n.a.
Computer programmer	820	.40	32	9
Drafter	950	.46	11	12
Electrical and/or electronic technician	540	.26	24	5
All other engineering technicians	1,630	.80	n.a.	n.a.
Science technicians	3,760	1.85	18	14
All other technicians	500	.24	n.a.	n.a.
SERVICE OCCUPATIONS	3,600	1.75	n.a.	n.a.
Janitor, porter, and/or cleaner	1,470	.72	19	23
Guard and/or doorkeeper	1,500	.73	15	14
Food service workers	80	.03	n.a.	n.a.
All other service workers	550	.27	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	120,130	58.85	n.a.	n.a.
Mechanic, automotive	1,040	.51	13	22
Engineering-equipment mechanic	280	.13	20	5
Mechanic, maintenance	3,610	1.77	13	21
All other mechanics and repairers	480	.23	n.a.	n.a.
Truck driver	5,650	2.78	9	41
Asbestos and insulation worker	820	.40	14	7
Boilermaker	1,550	.76	23	6
Carpenter	1,050	.51	16	12
Crane, derrick, and/or hoist operator	740	.36	20	10
Delivery and/or route worker	300	.14	22	7
Electrician	2,140	1.05	9	21
Supervisor, nonworking	10,440	5.14	7	45
Gager	1,400	.69	13	9
Heavy equipment operator	2,530	1.24	9	25
Rigger	300	.14	28	2
Industrial truck operator	2,630	1.29	8	26
Inspector	510	.25	21	8
Instrument repairer	2,120	1.04	11	12
Loader, tank cars and/or trucks	1,780	.87	10	20
Machinist	3,130	1.54	15	16
Maintenance repairer, general utility	3,500	1.72	13	27
Helper, trades	2,530	1.24	30	11
Millwright	220	.10	22	3
Oiler	170	.08	16	7
Order filler	560	.27	22	9
Painter, maintenance	770	.37	16	9

See footnotes at end of table.

Table 12. Petroleum and coal products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ May 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Plumber and/or pipefitter	4,220	2.08	14	13
Production packager, hand or machine	2,690	1.32	10	18
Stationary boiler firer	920	.45	13	10
Stationary engineer	870	.42	17	6
Asphalt blender	430	.21	17	9
Asphalt-mixing-machine tender	440	.21	21	11
Asphalt-plant operator	640	.31	9	21
Chemical operator A	1,360	.67	24	5
Chemical operator B	1,090	.53	25	5
Chemical operator helper	660	.32	30	5
Compounder	1,040	.51	10	17
Control panel operator, petroleum	1,720	.84	23	4
Dispatcher, refinery	480	.23	21	6
Firer, petroleum refining	400	.19	25	4
Greasemaker	220	.10	22	4
Instrument fitter	220	.10	28	2
Roof-cement-and-paint maker	270	.13	16	5
Sampler and/or test preparer	230	.11	18	5
Refinery operator, petroleum	13,470	6.63	11	18
Refinery operator helper, petroleum	7,360	3.62	12	14
Still operator, asphalt	460	.22	23	8
Tester	2,240	1.10	13	15
Treater	420	.20	19	5
Coater, roofing felt	910	.44	17	8
Chief operator	1,720	.84	22	5
Cutter machine	160	.07	14	5
Welder and/or flamecutter -a	1,370	.67	16	12
Welder and/or flamecutter -b	580	.28	17	8
Winder, roofing felt	280	.13	12	7
Filter and/or filter press operator	200	.09	40	2
Pump operator	1,900	.93	12	12
Pump operator helper	710	.34	24	5
All other skilled craft and kindred workers	1,680	.82	n.a.	n.a.
All other operatives and semiskilled workers	6,610	3.25	n.a.	n.a.
All other laborers and unskilled workers	11,910	5.87	n.a.	n.a.
CLERICAL OCCUPATIONS				
Bookkeeping and/or billing machine operator	29,510	14.40	n.a.	n.a.
Bookkeeping and/or billing machine operator	490	.24	28	12
Computer operator	610	.30	15	13
Keypunch operator	1,120	.55	24	15
Peripheral EDP equipment operator	240	.11	38	3
All other office machine operators	520	.25	n.a.	n.a.
Stenographer	1,560	.76	26	12
Accounting clerk	3,190	1.57	16	34
Bookkeeper, hand	360	.17	16	14
General clerk, office	3,240	1.59	16	32
Order clerk	480	.23	11	14
Payroll and/or timekeeping clerk	880	.43	14	29
Personnel clerk	420	.20	12	13
Procurement clerk	350	.17	11	11
Receptionist	250	.12	29	9
Secretary	5,110	2.51	30	45
Statistical clerk	940	.46	22	9
Switchboard operator	250	.12	17	6
Switchboard operator-receptionist	450	.22	8	25
Typist	1,350	.66	18	22
Clerical supervisor, office or plant	2,000	.98	23	22
All other office clerical workers	2,530	1.24	n.a.	n.a.
Production clerk and/or coordinator	540	.26	12	15
Shipping packer	410	.20	28	7
Shipping and/or receiving clerk	460	.22	12	17
Weigher, record-keeping	140	.06	18	6
Stock clerk, stockroom, warehouse or storage yard	960	.47	8	19
Dispatcher, vehicle, service or work	380	.18	14	13
All other plant clerical workers	280	.13	n.a.	n.a.

See footnotes at end of table.

Table 12. Petroleum and coal products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ May 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
SALES OCCUPATIONS	2,720	1.33	46	36
Sales representative, sales agent, and/or sales associate	2,590	1.27	12	34
Sales clerk	130	.06	34	3

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Rubber and Miscellaneous Plastics Products

This industry group includes establishments manufacturing rubber products such as tires, rubber footwear, mechanical rubber goods, heels and soles, flooring, and rubber sundries from natural, synthetic, or reclaimed rubber, gutta percha, balata, or gutta siak.

In 1977, the industry employed 721,500 workers or 4 percent of all workers employed in manufacturing. From 1971 to 1977, employment in the industry increased 19 percent.

The most populous occupations in the rubber and miscellaneous plastics industry, as shown in table 13, were: Compression/injection plastics molding machine operators, with 66,600 workers or 9 percent of total industry employment; class C assemblers, 32,600; and non-working supervisors for production and other blue-collar occupations, 31,700.

The occupational distribution of employment is shown in chart 10.

Chart 10. Rubber and miscellaneous plastics products: Distribution of employment by major occupational group, 1971 and 1977

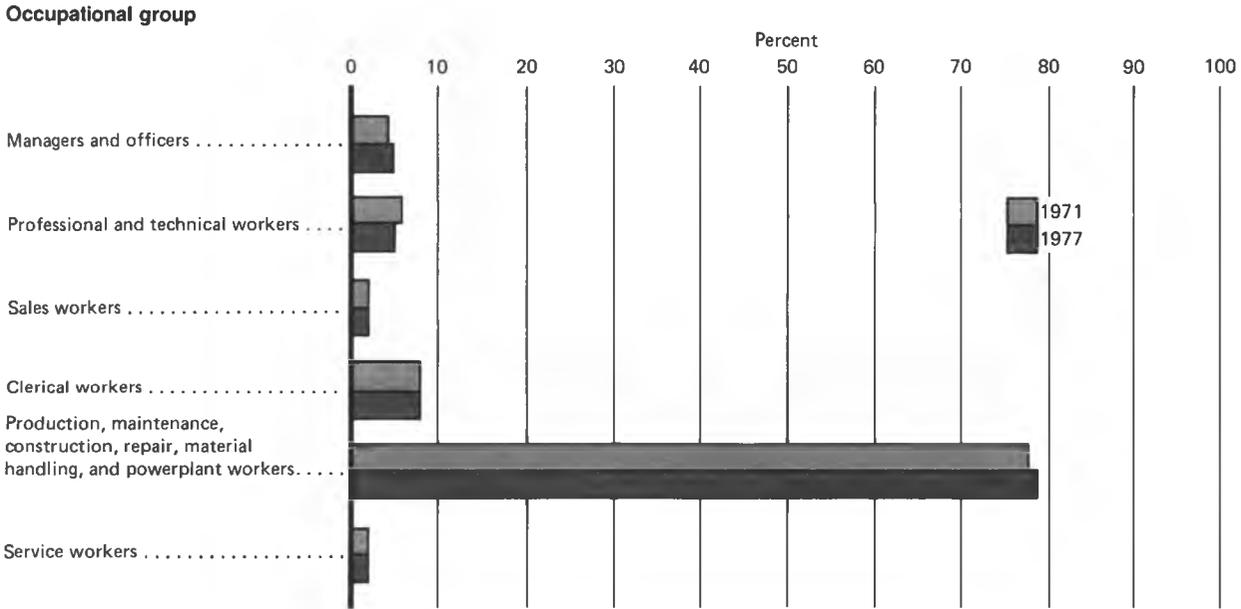


Table 13. Rubber and miscellaneous plastics products: Employment, relative standard error, and percent of establishments reporting selected occupations, June 1977

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
TOTAL	721,530	100.00	-	100
MANAGERS AND OFFICERS	37,090	5.14	3	93
PROFESSIONAL OCCUPATIONS	21,780	2.95	n.a.	n.a.
Chemical engineer	1,100	.15	12	5
Electrical and/or electronic engineer	540	.07	8	5
Industrial engineer	1,830	.25	6	11
Mechanical engineer	3,360	.46	11	16
All other engineers	1,970	.27	n.a.	n.a.
Mathematical scientist	80	.01	n.a.	n.a.
Chemist	1,720	.23	8	9
All other physical scientists	70	.00	n.a.	n.a.
Social scientist	40	.00	n.a.	n.a.
Systems analyst, electronic data processing	680	.09	16	4
Purchasing agent and/or buyer	2,160	.29	3	23
Accountant and/or auditor	4,440	.61	4	31
Personnel and labor relations specialists	1,470	.20	4	13
Designer	800	.11	10	6
All other professional workers	1,520	.21	n.a.	n.a.
TECHNICAL OCCUPATIONS	11,550	1.57	n.a.	n.a.
Computer programmer	810	.11	8	5
Drafter	1,440	.19	7	11
Industrial engineering technician	770	.10	12	4
All other engineering technicians	2,390	.33	n.a.	n.a.
Science technicians	4,940	.68	10	8
All other technicians	1,200	.16	n.a.	n.a.
SERVICE OCCUPATIONS	11,150	1.52	n.a.	n.a.
Janitor, porter, and/or cleaner	8,750	1.21	5	38
Guard and/or doorkeeper	1,600	.22	9	5
Food service workers	110	.01	n.a.	n.a.
Supervisor, nonworking--service only	480	.06	25	2
All other service workers	210	.02	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	568,200	78.25	n.a.	n.a.
Mechanic, maintenance	9,220	1.27	7	21
All other mechanics and repairers	2,360	.32	n.a.	n.a.
Truck driver	5,160	.71	8	27
Carpenter	520	.07	19	4
Electrician	3,700	.51	8	13
Supervisor, nonworking	31,660	4.38	3	56
Industrial truck operator	13,580	1.88	7	20
Inspector	22,920	3.17	5	35
Instrument repairer	1,090	.15	27	2
Machinist	9,040	1.25	7	27
Maintenance repairer, general utility	11,140	1.54	7	36
Helper, trades	1,370	.18	13	5
Millwright	1,140	.15	21	2
Oiler	1,070	.14	9	5
Order filler	5,460	.75	10	11
Painter, maintenance	440	.06	14	2
Plumber and/or pipefitter	1,580	.21	17	3
Press operator and/or plate printer	1,490	.20	17	3
Production packager, hand or machine	29,430	4.07	7	21
Sewing-machine operator, regular equipment-nongarment	9,070	1.25	10	4
Sewing-machine operator, special equipment and/or automatic equipment-nongarment	1,790	.24	25	1
Stationary boiler firer	550	.07	12	2
Stationary engineer	660	.09	10	2
Tool and die maker	5,610	.77	8	17
Welder and/or flamecutter	890	.12	15	4
Trimmer, machine	2,840	.39	16	2
Band builder	1,320	.18	35	1
Bead flipper	1,370	.18	15	1
Bead forming machine operator	900	.12	12	1

See footnotes at end of table.

Table 13. Rubber and miscellaneous plastics products: Employment, relative standard error, and percent of establishments reporting selected occupations, June 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Belt builder	1,000	0.13	45	1
Bias machine operator	2,510	.34	11	2
Braiding machine tender	1,120	.15	16	1
Chemical operator A	1,430	.19	20	2
Chemical operator B	1,040	.14	27	1
Chemical operator helper	970	.13	22	1
Curer, rubber goods	1,330	.18	18	2
Die cutter and/or clicking-machine operator	1,580	.21	13	5
Dipping machine operator	1,160	.16	25	1
Fabricator, plastics	2,310	.32	20	4
Pilling machine operator	510	.07	25	1
Finisher, hand	12,510	1.73	8	15
Finisher, machine	1,900	.26	16	5
Hose maker	1,000	.13	21	1
Mill roll rewinder, cellophane	480	.06	32	1
Rubber-mill operator	6,630	.91	6	9
Patternmaker, plastics	580	.08	20	3
Press operator, devulcanized scrap rubber	1,310	.18	36	0
Refiner operator, rubber	530	.07	24	1
Plastics repairer	480	.06	33	1
Rubber goods cutter-finisher	7,700	1.06	12	8
Rubber grinder-finisher	770	.10	26	1
Sawyer, plastics	1,120	.15	20	2
Slitting-machine operator	3,260	.45	16	5
Splicer	1,710	.23	20	1
Stripper	810	.11	28	1
Tester	1,830	.25	16	6
Tire builder	21,950	3.04	6	1
Tire finisher	2,150	.29	27	1
Tire layer and extractor	630	.08	30	0
Tire repairer	1,790	.24	19	1
Trimmer, plastics	2,910	.40	18	3
Splicer	1,080	.14	30	1
Tumbler operator, plastics	510	.07	18	2
Vulcanizer, footwear	650	.09	23	1
Watchcase vulcanizer tender	2,070	.28	22	1
Press tender, rubber goods	16,010	2.21	9	9
Painter, production	4,370	.60	14	7
Compression and/or injection-molding-machine operator, plastics	66,640	9.23	4	35
Conveyor operator or tender	2,050	.28	19	3
Setter, plastic molding machine	6,160	.85	8	19
Punch press operator, plastics	2,070	.28	24	2
Drier operator, chemicals, plastic resins, and rubber	930	.12	28	2
Mold cleaner, tire	830	.11	13	2
Chief operator	460	.06	23	1
Weigher, production	2,730	.37	10	8
Cutter machine	2,190	.30	18	6
Embossing, stamping, and/or marking machine - operator	3,020	.41	15	4
Grinder operator, chemicals, plastics, rubber, and related materials	3,490	.48	8	15
Calender operator, plastics or rubber	3,200	.44	13	6
Extruder operator, plastics or rubber	19,820	2.74	6	22
Extruder operator helper, plastics or rubber	8,160	1.13	9	12
Heat sealer	2,030	.28	20	2
Pipe and tank liner	790	.10	30	1
Assembler, class A	730	.10	23	2
Assembler, class B	5,000	.69	17	4
Assembler, class C	32,620	4.52	8	18
Calender operator helper, plastics or rubber	2,660	.36	11	4
Mixer and/or blender, chemicals and chemical - products	7,490	1.03	6	24
Bagger plastics	680	.09	40	1
Blow-molding machine operator	5,360	.74	16	5
Caster, plastics	1,150	.15	23	2

See footnotes at end of table.

Table 13. Rubber and miscellaneous plastics products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ June 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Laminator, preforms	2,890	0.40	21	4
Press operator, plastics	3,480	.48	18	3
Rotation molding machine operator	790	.10	37	1
Vacuum plastic forming machine operator	2,130	.29	22	2
All other skilled craft and kindred workers	4,980	.69	n.a.	n.a.
All other operatives and semiskilled workers	34,010	4.71	n.a.	n.a.
All other laborers and unskilled workers	50,590	7.01	n.a.	n.a.
CLERICAL OCCUPATIONS				
Bookkeeping and/or billing machine operator	60,890	8.30	n.a.	n.a.
Computer operator	500	.06	11	5
Key punch operator	1,030	.14	6	8
All other office machine operators	1,790	.24	6	8
Stenographer	480	.06	n.a.	n.a.
Accounting clerk	600	.08	10	4
Bookkeeper, hand	3,140	.43	4	18
File clerk	820	.11	8	9
General clerk, office	480	.06	11	4
Order clerk	7,780	1.07	6	43
Payroll and/or timekeeping clerk	1,780	.24	7	11
Personnel clerk	2,020	.27	4	18
Procurement clerk	1,080	.14	5	11
Receptionist	460	.06	8	5
Secretary	440	.06	11	5
Statistical clerk	8,500	1.17	4	51
Switchboard operator-receptionist	920	.12	10	5
Typist	1,470	.20	4	18
Clerical supervisor, office or plant	2,100	.29	7	10
All other office clerical workers	2,000	.27	21	7
Production clerk and/or coordinator	1,790	.24	n.a.	n.a.
Shipping packer	3,770	.52	5	18
Shipping and/or receiving clerk	7,820	1.08	6	34
Stock clerk, stockroom, warehouse or storage yard	6,010	.83	5	43
All other plant clerical workers	2,890	.40	6	15
	1,220	.16	n.a.	n.a.
SALES OCCUPATIONS				
Sales representative, sales agent, and/or sales associate	10,870	1.49	n.a.	n.a.
All other sales workers	10,510	1.45	5	37
	360	.04	n.a.	n.a.

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Leather and Leather Products

This industry group includes establishments tanning, currying, and finishing hides and skins, and in manufacturing finished leather and artificial leather products.

In 1977, the industry employed 260,000 workers or 1 percent of all workers employed in manufacturing. Employment declined 20 percent between 1971 and 1977.

The most populous occupations in the leather indus-

try, as shown in table 14, were: Stitchers (standard machine), with 27,100 workers or 10 percent of total industry employment; sewing machine operators, regular—nongarment, 17,400; and die cutters and/or clicking machine operators, 10,600.

The occupational distribution of employment is shown in chart 11.

Chart 11. Leather and leather products: Distribution of employment by major occupational group, 1971 and 1977

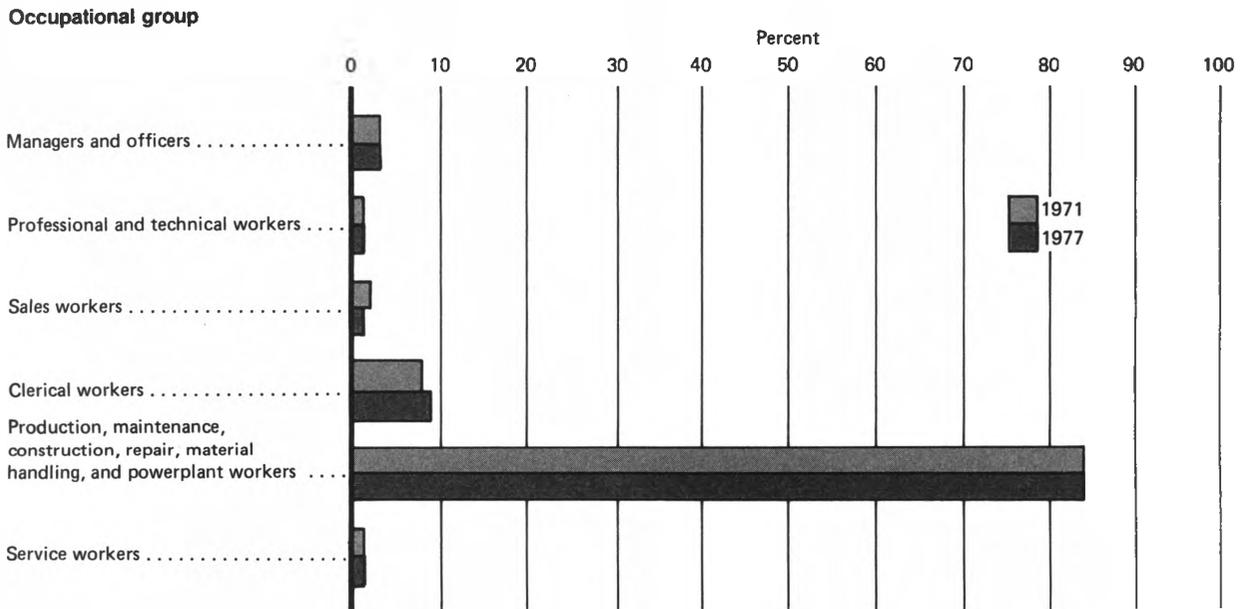


Table 14. Leather and leather products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ May 1977

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
TOTAL	259,960	100.00	-	100
MANAGERS AND OFFICERS	7,540	2.90	3	70
PROFESSIONAL OCCUPATIONS	3,100	1.16	n.a.	n.a.
Industrial engineer	360	.13	8	9
All other engineers	180	.06	n.a.	n.a.
Physical scientists	130	.05	n.a.	n.a.
Purchasing agent and/or buyer	780	.30	5	21
Accountant and/or auditor	680	.26	7	14
Personnel and labor relations specialists	240	.09	7	8
Designer	560	.21	8	11
All other professional workers	170	.06	n.a.	n.a.
TECHNICAL OCCUPATIONS	420	.15	n.a.	n.a.
Engineering technician	90	.03	n.a.	n.a.
Science technicians	70	.02	n.a.	n.a.
All other technicians	260	.10	n.a.	n.a.
SERVICE OCCUPATIONS	3,710	1.41	n.a.	n.a.
Janitor, porter, and/or cleaner	1,950	.75	3	33
Guard and/or doorkeeper	620	.23	7	9
Food service workers	160	.06	31	1
Supervisor, nonworking--service only	370	.14	14	4
All other service workers	610	.23	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	219,150	83.78	n.a.	n.a.
Mechanic, maintenance	990	.38	6	14
All other mechanics and repairers	160	.06	n.a.	n.a.
Presser, machine	270	.10	13	3
Truck driver	710	.27	6	15
Carpenter	350	.13	17	7
Electrician	240	.09	10	7
Supervisor, nonworking	6,750	2.59	4	42
Industrial truck operator	540	.20	7	8
Inspector	3,180	1.22	5	20
Machinist	1,050	.40	8	16
Maintenance repairer, general utility	1,460	.56	5	21
Helper, trades	170	.06	13	3
Order filler	1,060	.40	9	11
Production packager, hand or machine	3,580	1.37	5	26
Sewing-machine operator, regular equipment- nongarment	17,380	6.68	5	26
Sewing-machine operator, special equipment and/or automatic equipment-nongarment	4,690	1.80	13	13
Skiver	2,780	1.06	4	28
Trimmer, machine	2,570	.98	5	21
Assembler for puller-over, hand or machine	1,870	.71	7	14
Beamer, hand	230	.08	22	2
Beamer, machine	420	.16	6	5
Bed laster	720	.27	9	7
Bottom filler	720	.27	7	10
Buffer, hides or skins	660	.25	7	7
Buffer, shoe parts	1,840	.70	5	16
Burnisher	620	.23	8	9
Case maker	860	.33	16	4
Cementer, machine joiner	1,960	.75	7	12
Perforator operator	1,060	.40	5	17
Cobbler	1,050	.40	7	12
Cut-lace-machine operator	200	.07	16	3
Die cutter and/or clicking-machine operator	10,600	4.07	3	42
Flamer	540	.20	6	12
Floor worker, footwear	5,680	2.18	5	27
Folder, machine	800	.30	8	9
Glove turner and former	320	.12	12	3
Glue-spreading-machine operator, luggage	1,020	.39	14	6
Harness maker	170	.06	33	2
Heel attacher	940	.36	6	14

See footnotes at end of table.

Table 14. Leather and leather products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ May 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Heel breaster, leather	170	0.06	15	3
Heel builder, hand or machine	320	.12	21	3
Heel-seat laster, machine	670	.25	6	13
Heel seat fitter, machine	240	.09	12	5
Inker, hand or machine	1,280	.49	6	15
Laster, hand	1,020	.39	12	8
Lasting-machine operator, hand method	300	.11	12	4
Belt maker, apparel	320	.12	25	2
Leather stamper, hand	300	.11	16	4
Leather worker	440	.16	28	2
Limer	350	.13	11	4
Tanning-liquor maker	330	.12	9	5
Luggage maker	2,080	.80	27	3
Measuring-machine operator, leather	560	.21	14	7
Patternmaker	570	.21	10	10
Puller-over	460	.17	9	6
Repairer, finish	2,590	.99	5	18
Roller-machine operator	180	.06	15	3
Rough rounder, machine	570	.21	6	9
Saddle maker	470	.18	23	2
Seam-rubbing-machine operator	550	.21	7	9
Seasoner, machine	290	.11	13	3
Seasoning mixer	220	.08	12	3
All other skilled craftsmen and Shoe parts sewer, hand	3,200	1.23	15	6
Shank-piece tacker	450	.17	6	10
Side laster	1,240	.47	4	15
Sole leveler, machine	440	.16	14	5
Sorter, leather	2,050	.78	5	23
Splitting-machine feeder	670	.25	7	8
Sprayer, hand and/or machine	1,980	.76	5	19
Stainer	620	.23	10	8
Staker, machine	610	.23	7	6
Stitchdown-thread laster	160	.06	17	2
Stitcher, special machine	2,010	.77	6	14
Stitcher, standard machine	27,100	10.42	3	26
Stitcher, utility	3,030	1.16	8	16
Tacker, toggler, and paster	1,440	.55	7	6
Tanning drum operator and/or colorer, hides or skins	860	.33	6	7
Thermalasting-machine operator	270	.10	23	3
Toe laster	720	.27	9	7
Treer	2,300	.88	4	15
Vulcanizer, footwear	300	.11	21	2
Wringer-machine operator	730	.28	6	6
Riveter, light	1,680	.64	7	12
Compression and/or injection-molding-machine operator, plastics	590	.22	20	3
Conveyor operator or tender	880	.33	11	10
Vamp creaser	320	.12	10	7
Splitter, machine	950	.36	6	17
* Fastener, machine	1,500	.57	6	13
Cementer, paster, backer, or fitter, hand	8,040	3.09	5	22
Eyelet-machine operator	1,400	.53	6	21
Molder, shoe parts	540	.20	13	5
Pulling and lasting-machine operator	1,240	.47	7	11
Cutter, hand	2,830	1.08	7	23
Gluer and/or cementer, hand	3,380	1.30	8	16
Instructor, leather or footwear machinery	590	.22	9	8
Handbag framer	500	.19	11	5
Embossing, stamping, and/or marking machine - operator	2,820	1.08	5	26
Assembler, class A	740	.28	18	4
Assembler, class B	2,240	.86	13	8
Assembler, class C	6,580	2.53	12	17
All other skilled craft and kindred workers	2,320	.89	n.a.	n.a.
All other operatives and semiskilled workers	17,410	6.69	n.a.	n.a.
All other laborers and unskilled workers	17,930	6.89	n.a.	n.a.

See footnotes at end of table.

Table 14. Leather and leather products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ May 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
CLERICAL OCCUPATIONS	22,260	8.45	n.a.	n.a.
Bookkeeping and/or billing machine operator	370	.14	8	10
Computer operator	330	.12	9	7
Keypunch operator	570	.21	13	6
All other office machine operators	300	.11	n.a.	n.a.
Stenographer	300	.11	12	6
Accounting clerk	860	.33	8	15
Bookkeeper, hand	810	.31	4	24
File clerk	270	.10	9	8
General clerk, office	2,780	1.06	9	25
Order clerk	900	.34	9	13
Payroll and/or timekeeping clerk	1,580	.60	4	30
Personnel clerk	260	.10	6	9
Procurement clerk	390	.15	8	9
Secretary	1,070	.41	7	22
Statistical clerk	170	.06	14	4
Switchboard operator-receptionist	560	.21	4	19
Typist	660	.25	9	12
Clerical supervisor, office or plant	1,010	.38	14	13
All other office clerical workers	940	.36	n.a.	n.a.
Production clerk and/or coordinator	830	.31	7	14
Shipping packer	3,560	1.36	6	34
Shipping and/or receiving clerk	1,980	.76	4	39
Stock clerk, stockroom, warehouse or storage yard	1,360	.52	9	18
All other plant clerical workers	400	.15	n.a.	n.a.
SALES OCCUPATIONS	3,780	1.44	24	27
Sales representative, sales agent, and/or sales associate	2,820	1.08	7	20
Sales clerk	960	.36	18	7

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Glass and Glass Products

This industry group includes establishments manufacturing flat glass and other glass products.

In 1977, the industry employed 199,100 workers or 1 percent of all workers employed in manufacturing. From 1971 to 1977, employment in the industry increased 8 percent.

The most populous occupations in the glass industry, as shown in table 15, were: Glassware selectors, with

30,100 workers or 15 percent of total industry employment; production packagers (hand or machine), 8,600; nonworking supervisors for production and other blue-collar occupations, 7,800; and forming machine operators (glass container), 7,300.

The occupational distribution of employment is shown in chart 12.

Chart 12. Glass and glass products: Distribution of employment by major occupational group, 1971 and 1977

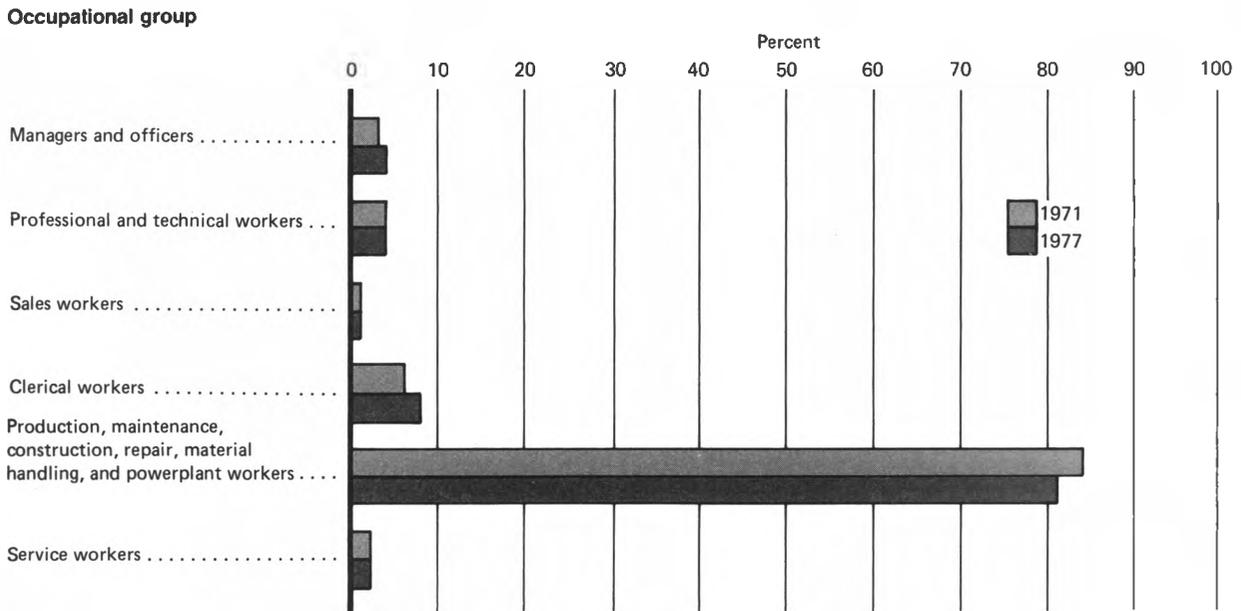


Table 15. Glass and glass products: Employment, relative standard error, and percent of establishments reporting selected occupations, May 1977

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
TOTAL	199,060	100.00	-	100
MANAGERS AND OFFICERS	8,130	4.08	6	5
PROFESSIONAL OCCUPATIONS	5,710	2.83	n.a.	n.a.
Electrical and/or electronic engineer	220	.11	10	1
Industrial engineer	380	.19	10	1
Mechanical engineer	680	.34	9	1
Ceramic engineer	250	.12	31	1
All other engineers	540	.27	n.a.	n.a.
Chemist	280	.14	19	0
Systems analyst, electronic data processing	130	.06	15	0
Purchasing agent and/or buyer	550	.27	7	2
Accountant and/or auditor	840	.42	9	2
Nurse, professional	250	.12	7	1
Personnel and labor relations specialists	580	.29	5	1
Designer	370	.18	13	1
All other professional workers	640	.32	n.a.	n.a.
TECHNICAL OCCUPATIONS	2,570	1.27	n.a.	n.a.
Computer programmer	200	.10	15	1
Drafter	490	.24	14	1
Electrical and/or electronic technician	340	.17	24	0
Mechanical engineering technician	160	.08	22	0
All other engineering technicians	380	.19	n.a.	n.a.
Science technicians	450	.22	15	0
All other technicians	550	.27	n.a.	n.a.
SERVICE OCCUPATIONS	3,840	1.92	n.a.	n.a.
Janitor, porter, and/or cleaner	2,450	1.23	7	2
Guard and/or doorkeeper	560	.28	9	1
Food service workers	60	.03	n.a.	n.a.
Supervisor, nonworking--service only	150	.07	26	0
All other service workers	620	.31	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	161,640	80.88	n.a.	n.a.
Mechanic, automotive	420	.21	7	1
Mechanic, maintenance	2,440	1.22	9	1
All other mechanics and repairers	670	.33	n.a.	n.a.
Truck driver	1,360	.68	14	2
Carpenter	370	.18	12	1
Crane, derrick, and/or hoist operator	250	.12	33	0
Electrician	1,390	.69	6	1
Supervisor, nonworking	7,840	3.93	6	3
Industrial truck operator	5,740	2.88	6	2
Inspector	6,560	3.29	9	2
Instrument repairer	450	.22	12	1
Machinist	1,110	.55	15	1
Maintenance repairer, general utility	3,070	1.54	9	2
Helper, trades	470	.23	15	1
Millwright	1,070	.53	16	0
Oiler	360	.18	14	1
Order filler	1,030	.51	20	1
Painter, maintenance	200	.10	10	1
Plumber and/or pipefitter	500	.25	10	0
Production packager, hand or machine	8,600	4.31	9	2
Sheet metal worker	150	.07	34	0
Stationary engineer	220	.11	18	0
Tool and die maker	160	.08	32	0
Welder and/or flamecutter	460	.23	19	1
Batch, furnace, and/or tank operator, glass	1,810	.90	8	2
Beveler	1,010	.50	26	1
Breaker	570	.28	24	0
Decal applier	200	.10	21	0
Drill-press and/or boring-machine operator	180	.09	39	0
Driller, machine and/or driller, multiple spindle	290	.14	28	0
Etcher and/or engraver	540	.27	26	1
Forming-machine operator, glass container	7,320	3.67	7	1

See footnotes at end of table.

Table 15. Glass and glass products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ May 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Forming-machine maintainer, glass	2,720	1.36	7	1
Furnace combustion analyst	210	.10	20	0
Gatherer	690	.34	13	1
Glass blower, glassware and/or laboratory apparatus	1,040	.52	17	1
Glass-blowing-lathe operator	790	.39	20	0
Glass calibrator	180	.09	46	0
Glass-cut-off machine operator and/or cutting-machine operator	1,490	.74	12	1
Glass cutter, machine	780	.39	24	1
Glass finisher	470	.23	33	0
Glass grinder and/or watch-crystal edge grinder	1,220	.61	19	1
Glazier, stained glass and/or joiner	950	.47	14	1
Hand edger and/or belt seamer	620	.31	19	1
Kiln tender, glass	170	.08	31	0
Lathe operator, grinding wheels	240	.12	42	0
Lehr tender	1,410	.70	17	1
Machine tool operator, combination	280	.14	44	0
Molding-machine operator and/or presser	460	.23	21	0
Polisher, glass and/or blocker	1,010	.50	19	1
Polisher, mold	1,120	.56	9	1
Second cutter, hand	1,080	.54	17	1
Selector, glassware	30,090	15.11	7	2
Slitter-creaser-slotter operator	250	.12	20	0
Slitting-machine operator	140	.07	41	0
Sliver-forming-and-winding operator and/or fiber-machine tender	2,170	1.09	43	0
Tester	1,800	.90	9	1
Warm-in worker	480	.24	22	0
Yardage control operator, forming	190	.09	38	0
Painter, production	350	.17	16	1
Conveyor operator or tender	620	.31	30	0
Mixer, stone, clay, glass and related products	490	.24	12	1
Cullet crusher-and-washer	440	.22	12	1
Metal mold maker and/or repairer	3,290	1.65	10	1
Floor worker, glass	3,210	1.61	14	1
Screen or stencil printer and/or setter	700	.35	19	1
Screen maker, photographic process	130	.06	22	0
Ware finisher, footcaster and/or handler	300	.15	21	0
Assembler	4,770	2.39	19	1
Decorator, hand	1,250	.62	25	1
Batch plant operator	190	.09	16	0
All other skilled craft and kindred workers	2,880	1.44	n.a.	n.a.
All other operatives and semiskilled workers	16,350	8.21	n.a.	n.a.
All other laborers and unskilled workers	17,810	8.94	n.a.	n.a.
CLERICAL OCCUPATIONS				
Bookkeeping and/or billing machine operator	14,760	7.32	n.a.	n.a.
Bookkeeping and/or billing machine operator	190	.09	13	1
Computer operator	240	.12	12	1
Keypunch operator	370	.18	19	1
All other office machine operators	130	.06	n.a.	n.a.
Stenographer	290	.14	10	1
Accounting clerk	900	.45	9	2
Bookkeeper, hand	380	.19	9	1
File clerk	160	.08	30	0
General clerk, office	1,350	.67	14	2
Order clerk	400	.20	12	1
Payroll and/or timekeeping clerk	590	.29	7	2
Personnel clerk	270	.13	7	1
Procurement clerk	160	.08	10	1
Secretary	1,860	.93	6	3
Statistical clerk	160	.08	27	0
Switchboard operator-receptionist	340	.17	7	2
Typist	630	.31	10	1
Clerical supervisor, office or plant	280	.14	21	1
All other office clerical workers	930	.46	n.a.	n.a.
Production clerk and/or coordinator	750	.37	10	1

See footnotes at end of table.

Table 15. Glass and glass products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ May 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
CLERICAL OCCUPATIONS—Continued				
Shipping packer	2,300	1.15	18	2
Shipping and/or receiving clerk	990	.49	10	2
Stock clerk, stockroom, warehouse or storage yard	680	.34	10	1
All other plant clerical workers	410	.20	n.a.	n.a.
SALES OCCUPATIONS	2,410	1.20	29	2
Sales representative, sales agent, and/or sales associate	2,060	1.03	12	2
Sales clerk	350	.17	17	1

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Stone, Clay, and Concrete Products

This industry group includes establishments manufacturing cement, structural clay products, pottery, concrete and gypsum products, cut stone, and abrasive and asbestos products from materials taken principally from the earth in the form of stone, clay, and sand.

In 1977, the industry employed 471,800 workers or 3 percent of all workers employed in manufacturing. From 1971 to 1977, employment in the industry increased 8 percent.

The most populous occupations in the stone, clay, and concrete industry, as shown in table 16, were: Truck drivers, with 57,400 workers or 12 percent of total industry employment; nonworking supervisors for production and other blue-collar occupations, 17,300; industrial truck operators, 13,400; and sales agents-representatives-associates, 9,600.

The occupational distribution of employment is shown in chart 13.

Chart 13. Stone, clay, and concrete products: Distribution of employment by major occupational group, 1971 and 1977

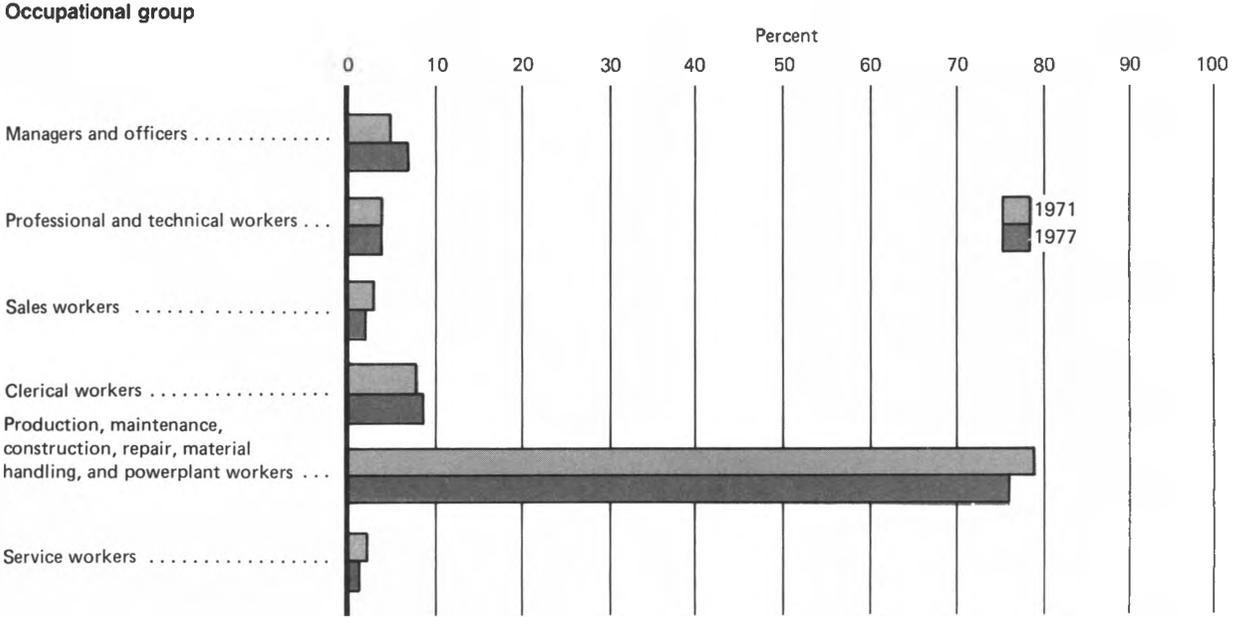


Table 16. Stone, clay, and concrete products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ May 1977

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
TOTAL	471,830	100.00	-	100
MANAGERS AND OFFICERS	33,840	7.17	2	88
PROFESSIONAL OCCUPATIONS	12,420	2.59	n.a.	n.a.
Chemical engineer	520	.11	23	1
Civil engineer	380	.08	16	2
Industrial engineer	830	.17	7	4
Mechanical engineer	1,020	.21	11	4
Ceramic engineer	740	.15	13	3
All other engineers	1,170	.24	n.a.	n.a.
Chemist	1,090	.23	8	3
All other physical scientists	110	.02	n.a.	n.a.
Purchasing agent and/or buyer	1,420	.30	5	9
Accountant and/or auditor	3,130	.66	5	17
Personnel and labor relations specialists	810	.17	6	5
Designer	340	.07	14	1
All other professional workers	860	.18	n.a.	n.a.
TECHNICAL OCCUPATIONS	6,460	1.33	n.a.	n.a.
Computer programmer	460	.09	15	2
Drafter	1,910	.40	5	9
Mechanical engineering technician	370	.07	19	1
All other engineering technicians	1,410	.29	n.a.	n.a.
Science technicians	1,710	.36	11	3
All other technicians	600	.12	n.a.	n.a.
SERVICE OCCUPATIONS	6,520	1.35	n.a.	n.a.
Janitor, porter, and/or cleaner	4,990	1.05	3	24
Guard and/or doorkeeper	870	.18	8	3
Food service workers	60	.01	n.a.	n.a.
Supervisor, nonworking--service only	460	.09	20	1
All other service workers	140	.02	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	358,350	75.46	n.a.	n.a.
Mechanic, automotive	7,400	1.56	3	31
Engineering-equipment mechanic	780	.16	13	2
Mechanic, maintenance	8,850	1.87	4	17
All other mechanics and repairers	1,400	.29	n.a.	n.a.
Truck driver	57,400	12.16	2	69
Blaster, mining and quarrying	350	.07	15	2
Carpenter	850	.18	11	4
Concrete rubber	3,020	.64	8	8
Crane, derrick, and/or hoist operator	3,540	.75	5	13
Delivery and/or route worker	4,940	1.04	7	8
Driller, machine	700	.14	12	2
Electrician	2,980	.63	3	8
Supervisor, nonworking	17,300	3.66	2	36
Heavy equipment operator	8,130	1.72	5	22
Rigger	660	.13	12	2
Industrial truck operator	13,410	2.84	3	33
Inspector	5,130	1.08	9	6
Instrument repairer	480	.10	20	2
Machinist	2,420	.51	12	5
Maintenance repairer, general utility	8,740	1.85	4	27
Helper, trades	2,320	.49	16	4
Millwright	1,140	.24	17	1
Oiler	1,600	.33	7	5
Order filler	2,650	.56	8	8
Painter, maintenance	400	.08	10	2
Panelboard operator and/or grinding mill - panelboard operator	1,100	.23	15	2
Pipe stripper	1,780	.37	10	5
Plumber and/or pipefitter	490	.10	14	1
Production packager, hand or machine	8,350	1.76	8	7
Refractory materials repairer	750	.15	9	3
Rock splitter, quarry	480	.10	14	1
Sheet metal worker	780	.16	21	1

See footnotes at end of table.

Table 16. Stone, clay, and concrete products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ May 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Stationary boiler firer	360	0.07	13	1
Tool and die maker	790	.16	13	2
Welder and/or flamecutter	4,160	.88	6	12
Abrasive grinder	780	.16	25	1
Blockmaking-machine operator	3,770	.79	8	14
Brick-and-tile making machine operator	2,250	.47	12	4
Cage maker, hand or machine	1,580	.33	8	6
Calender machine operator	450	.09	39	0
Caster, pottery and porcelain	3,690	.78	12	2
Caster, plaster of paris	300	.06	49	0
Concrete-pipe maker	3,690	.78	8	8
Concrete-stone fabricator	5,310	1.12	9	8
Decal applier	650	.13	21	0
Dipper	730	.15	16	1
Drill-press and/or boring-machine operator	340	.07	24	1
Finisher, pottery and porcelain	2,500	.52	12	2
Gasket winder	420	.08	32	0
Grinding and/or abrading machine operator, metal	370	.07	27	1
Jigger operator	600	.12	20	1
Kiln operator	7,460	1.58	4	14
Lathe operator, grinding wheels	700	.14	20	1
Lathe and/or turning machine operator, metal	690	.14	23	1
Machine tool operator, combination	1,210	.25	20	1
Model and mold maker, plaster	420	.08	40	1
Mold maker	400	.08	17	1
Refractory molder, hand	430	.09	22	1
Mold maker, brick, tile, and concrete	550	.11	18	1
Mold maker, pottery	1,080	.22	17	2
Power-press tender	1,920	.40	20	2
Refractory-grinder operator	700	.14	27	1
Sandblaster, stone	420	.08	14	2
Sawyer, stone	1,100	.23	9	3
Screener operator	890	.18	19	2
Setter and/or drawer	7,550	1.60	5	7
Slitting-machine operator	390	.08	17	1
Sorter	3,220	.68	10	3
Splitter	430	.09	15	1
Spray machine operator	780	.16	13	2
Stencil cutter	470	.09	15	1
Stone cutter, hand	820	.17	9	2
Stone cutter, machine	290	.06	18	1
Stone driller	300	.06	22	1
Stone polisher	1,050	.22	9	3
Tester	1,810	.38	8	5
Clay turner	550	.11	26	0
Press operator	6,700	1.41	9	5
Painter, production	730	.15	21	1
Conveyor operator or tender	1,330	.28	10	3
Mixer, stone, clay, glass and related products	2,550	.54	11	5
Concrete-vault maker	3,160	.66	10	6
Bed setter	310	.06	27	1
Mill and/or grinder operator, minerals	3,850	.81	7	8
Screen or stencil printer and/or setter	390	.08	26	0
Ware finisher, footcaster and/or handler	700	.14	24	1
Filter and/or filter press operator	340	.07	20	1
Assembler	6,440	1.36	11	3
Decorator, hand	1,010	.21	18	1
Batch plant operator	7,110	1.50	3	42
Clay maker	590	.12	12	2
Miller, clay	680	.14	15	2
Mixer and/or blender, chemicals and chemical - products	1,080	.22	15	2
All other skilled craft and kindred workers	6,530	1.38	n.a.	n.a.
All other operatives and semiskilled workers	27,600	5.84	n.a.	n.a.
All other laborers and unskilled workers	48,560	10.29	n.a.	n.a.

See footnotes at end of table.

Table 16. Stone, clay, and concrete products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ May 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
CLERICAL OCCUPATIONS	43,870	9.16	n.a.	n.a.
Bookkeeping and/or billing machine operator	460	.09	10	3
Computer operator	590	.12	7	3
Keypunch operator	840	.17	7	3
All other office machine operators	240	.05	n.a.	n.a.
Stenographer	480	.10	13	2
Accounting clerk	3,540	.75	4	19
Bookkeeper, hand	4,160	.88	4	30
File clerk	370	.07	14	2
General clerk, office	6,560	1.39	3	35
Order clerk	1,220	.25	7	5
Payroll and/or timekeeping clerk	1,390	.29	4	10
Personnel clerk	410	.08	6	3
Procurement clerk	350	.07	9	2
Secretary	5,930	1.25	8	32
Switchboard operator-receptionist	810	.17	5	7
Typist	1,140	.24	7	5
Clerical supervisor, office or plant	990	.20	8	5
All other office clerical workers	1,220	.25	n.a.	n.a.
Production clerk and/or coordinator	1,400	.29	6	6
Shipping packer	4,010	.84	6	8
Shipping and/or receiving clerk	1,850	.39	7	9
Weigher, record-keeping	370	.07	14	1
Stock clerk, stockroom, warehouse or storage yard	1,410	.29	7	6
Dispatcher, vehicle, service or work	3,630	.76	3	24
All other plant clerical workers	500	.10	n.a.	n.a.
SALES OCCUPATIONS	10,370	2.19	17	37
Sales representative, sales agent, and/or sales associate	9,600	2.03	3	34
Sales clerk	770	.16	14	3

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Primary Metals

This industry includes establishments operating blast furnaces, steel works, rolling and finishing mills, and iron and steel foundries, as well as establishments manufacturing miscellaneous primary metal products.

In 1977, the industry employed 1.1 million workers or 6 percent of all workers employed in manufacturing. Employment declined 9 percent between 1971 and 1977.

The most populous occupations in the primary met-

als industry, as shown in table 17, were: Nonworking supervisors for production and other blue-collar occupations, with 63,500 workers or 6 percent of total industry employment; crane, derrick, and hoist operators, 30,500; maintenance mechanics, 25,300; and inspectors, 24,100.

The occupational distribution of employment is shown in chart 14.

Chart 14. Primary metals: Distribution of employment by major occupational group, 1971 and 1977

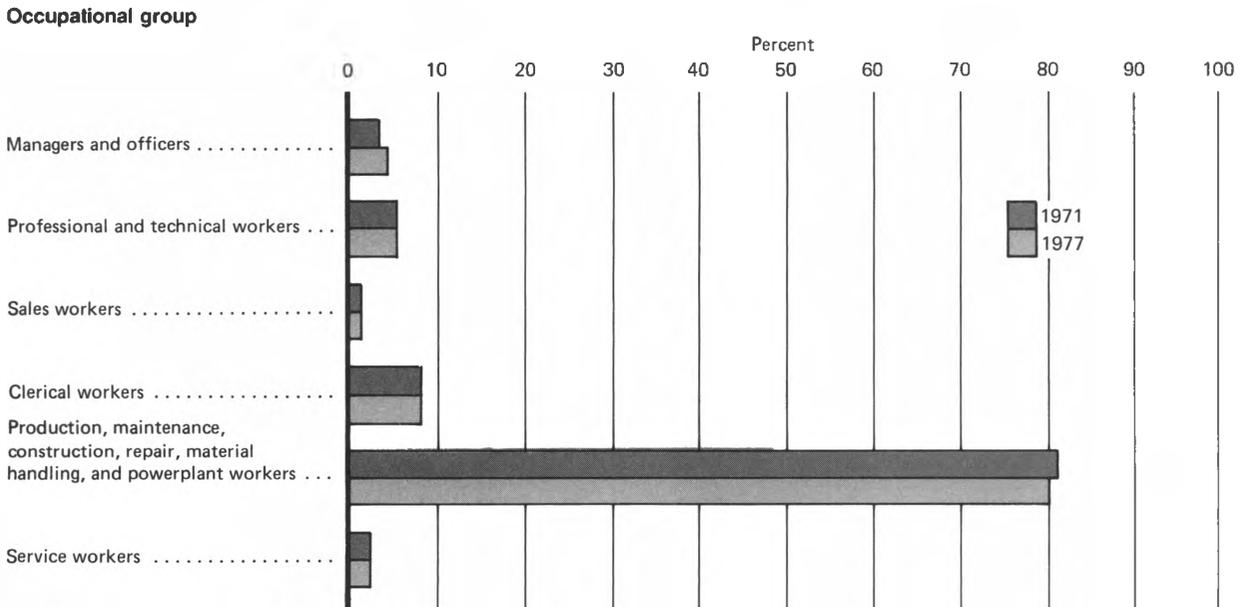


Table 17. Primary metals: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ April 1977

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
TOTAL	1,094,610	100.00	-	100
MANAGERS AND OFFICERS	39,620	3.61	6	93
PROFESSIONAL OCCUPATIONS	36,990	3.30	n.a.	n.a.
Civil engineer	720	.06	33	3
Electrical and/or electronic engineer	1,950	.17	14	11
Industrial engineer	3,290	.30	9	19
Mechanical engineer	3,900	.35	10	19
Metallurgist and/or metallurgical engineer	3,640	.33	10	20
Safety engineer	730	.06	11	8
All other engineers	3,470	.31	n.a.	n.a.
Mathematical scientist	20	.00	n.a.	n.a.
Chemist	1,590	.14	11	8
All other physical scientists	140	.01	n.a.	n.a.
Systems analyst, electronic data processing	1,580	.14	15	9
Purchasing agent and/or buyer	3,260	.29	6	34
Accountant and/or auditor	5,280	.48	7	30
Nurse, professional	1,190	.10	7	10
Personnel and labor relations specialists	2,820	.25	9	23
All other professional workers	3,410	.31	n.a.	n.a.
TECHNICAL OCCUPATIONS	17,640	1.57	n.a.	n.a.
Computer programmer	1,400	.12	9	10
Drafter	3,320	.30	9	19
Electrical and/or electronic technician	1,340	.12	26	6
Mechanical engineering technician	720	.06	21	3
Spectroscopist	890	.08	12	6
Industrial engineering technician	1,990	.18	15	7
All other engineering technicians	4,480	.40	n.a.	n.a.
Science technicians	660	.06	18	2
All other technicians	2,840	.25	n.a.	n.a.
SERVICE OCCUPATIONS	21,890	1.97	n.a.	n.a.
Janitor, porter, and/or cleaner	12,610	1.15	11	41
Guard and/or doorkeeper	6,210	.56	12	15
Food service workers	820	.07	24	2
Supervisor, nonworking--service only	1,270	.11	13	6
All other service workers	980	.08	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	877,100	79.55	n.a.	n.a.
Mechanic, automotive	5,770	.52	14	14
Mechanic, maintenance	25,300	2.31	18	23
All other mechanics and repairers	3,330	.30	n.a.	n.a.
Truck driver	9,860	.90	10	38
Boilermaker	2,300	.21	31	1
Braker, train	2,250	.20	15	4
Carpenter	3,030	.27	13	13
Crane, derrick, and/or hoist operator	30,540	2.79	13	19
Electrician	19,620	1.79	13	29
Filer, grinder, buffer, chipper, cleaner, and/or - polisher	22,420	2.04	6	30
Supervisor, nonworking	63,540	5.80	2	63
Heater, metal	2,940	.26	12	5
Rigger	6,000	.54	20	5
Industrial truck operator	23,510	2.14	4	38
Inspector	24,130	2.20	7	40
Instrument repairer	2,280	.20	16	4
Machinist	14,560	1.33	10	25
Maintenance repairer, general utility	11,060	1.01	6	41
Helper, trades	12,140	1.10	17	15
Millwright	16,850	1.53	20	10
Dinkey operator	670	.06	26	2
Oiler	3,420	.31	14	15
Order filler	2,620	.23	22	7
Painter, maintenance	1,590	.14	13	8
Pourer, metal	12,000	1.09	5	33
Electroplater	1,600	.14	20	4

See footnotes at end of table.

Table 17. Primary metals: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ April 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Plumber and/or pipefitter	6,150	0.56	17	8
Production packager, hand or machine	8,750	.79	14	10
Refractory materials repairer	6,080	.55	7	15
Sandblaster and/or shotblaster	3,740	.34	7	18
Sheet metal worker	1,100	.10	17	3
Stationary boiler firer	960	.08	11	3
Stationary engineer	2,120	.19	17	4
Tool and die maker	4,800	.43	9	14
Catcher	1,520	.13	17	2
Caster, ingots and pigs	2,060	.18	22	3
Centrifugal-casting-machine operator	940	.08	30	1
Coiler, winder and/or spooler	6,980	.63	11	8
Coremaker, hand, bench and/or floor	6,830	.62	10	27
Coremaker, machine	4,720	.43	11	17
Die polisher, wire and/or tubes	1,320	.12	14	6
Draw-bench operator and/or tube drawer	3,480	.31	26	4
Drill-press and/or boring-machine operator	3,930	.35	11	9
Insulating extruding machine operator and/or - insulating lead press operator	5,730	.52	15	5
Extrusion press operator, hot billets	2,620	.23	25	4
Forging press operator	690	.06	32	1
Forging and/or straightening-roll operator	1,840	.16	18	3
Grinding and/or abrading machine operator, metal	12,590	1.15	9	26
Guide setter	690	.06	14	2
Heat treater, annealer, and/or temperer	8,240	.75	11	21
Heater, coke production	740	.06	17	1
Lathe and/or turning machine operator, metal	5,280	.48	16	9
Lay-out marker, metal	900	.08	15	4
Machine tool operator, combination	4,570	.41	22	8
Machine tool operator, numerical-control	1,070	.09	22	3
Machine tool operator, toolroom	1,460	.13	20	4
Machine tool setter, metalworking	1,780	.16	16	5
Milling and/or planing machine operator	1,710	.15	19	5
Mixer operator, hot metal	1,020	.09	19	3
Molder, bench and/or floor	8,920	.81	13	27
Molder, machine	12,890	1.17	5	27
Molder, pattern	840	.07	34	2
Patternmaker, metal	1,370	.12	13	7
Patternmaker, wood	2,250	.20	9	14
Pickler, continuous pickling line	2,180	.19	13	6
Plater helper	1,050	.09	21	2
Pump operator, by-products	740	.06	21	1
Roll builder	1,430	.13	15	3
Sampler and/or test preparer	1,960	.17	28	5
Sawyer, metal	4,520	.41	11	10
Setter, molding-and-coremaking machine	1,440	.13	22	6
Shakeout worker, foundry	8,520	.77	5	30
Shell-mold and/or shell-core-machine operator	3,300	.30	12	10
Steel pourer helper	2,270	.20	17	4
Stranding machine operator	6,220	.56	17	5
Stretcher-leveler operator	1,650	.15	23	4
Tester	4,550	.41	14	13
Stove tender and/or blast furnace keeper	1,330	.12	16	1
Wax pattern worker	3,060	.27	22	3
Wire drawer	8,010	.73	13	9
Painter, production	1,860	.16	29	7
Die-casting machine operator, metal and/or die-- casting setter	7,620	.69	8	8
Punch-press operator, metal	7,560	.69	10	13
Shear and/or slitter operator, metal	6,210	.56	14	9
Shear and/or slitter setter	1,010	.09	17	3
Conveyor operator or tender	1,730	.15	17	2
Manipulator, table and/or bed operator	2,040	.18	23	3
Core assembler, paster and/or finisher	2,960	.27	10	10
Dip plater, non-electrolytic	1,220	.11	16	3
Furnace operator and/or cupola tender	10,070	.91	6	44
Mixer, ore and metals	800	.07	20	2

See footnotes at end of table.

Table 17. Primary metals: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ April 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Furnace charger	5,170	0.47	9	12
Heating pit charger	1,450	.13	18	3
Furnace operator helper or heater helper	5,530	.50	11	19
Insulation wrapping or braiding machine operator	2,150	.19	22	4
Yard engineer	1,800	.16	25	3
Scrap sorter	1,630	.14	13	7
Power brake and/or bending machine operator, metal	1,220	.11	22	3
Mill and/or grinder operator, minerals	2,210	.20	19	5
Sinter press setter and/or operator	1,110	.10	27	1
Coke oven pusher and/or door operator	1,560	.14	21	1
Weigher, production	2,370	.21	10	7
Mold closer, core setter and/or weight and jacket setter	3,590	.32	9	9
Welder and/or flamecutter -a	10,600	.96	15	12
Welder and/or flamecutter -b	6,520	.59	13	11
Welder and/or flamecutter -c	3,960	.36	16	9
Tapper, metal	1,860	.16	20	3
Pump operator	1,620	.14	26	2
Sand cutter, mixer and/or slinger	2,900	.26	7	20
Assembler	7,870	.71	21	7
Rolling mill operator and/or attendant, rough or -finished	6,710	.61	11	10
Rolling mill operator helper, rough or finished	4,310	.39	14	7
All other skilled craft and kindred workers	27,500	2.51	n.a.	n.a.
All other operatives and semiskilled workers	90,690	8.28	n.a.	n.a.
All other laborers and unskilled workers	121,450	11.09	n.a.	n.a.
CLERICAL OCCUPATIONS				
Bookkeeping and/or billing machine operator	93,130	8.41	n.a.	n.a.
Bookkeeping and/or billing machine operator	760	.06	19	8
Computer operator	1,600	.14	16	11
Keypunch operator	2,740	.25	9	13
All other office machine operators	1,010	.09	n.a.	n.a.
Stenographer	2,240	.20	13	9
Accounting clerk	5,820	.53	12	26
Bookkeeper, hand	1,970	.17	10	24
File clerk	1,100	.10	14	7
General clerk, office	8,120	.74	14	36
Order clerk	2,120	.19	12	13
Payroll and/or timekeeping clerk	3,910	.35	7	29
Personnel clerk	1,460	.13	6	17
Procurement clerk	940	.08	14	11
Secretary	8,040	.73	7	42
Statistical clerk	1,400	.12	14	6
Switchboard operator-receptionist	1,430	.13	9	25
Typist	3,860	.35	12	19
Clerical supervisor, office or plant	3,210	.29	13	12
All other office clerical workers	6,360	.58	n.a.	n.a.
Production clerk and/or coordinator	9,770	.89	14	29
Shipping packer	6,870	.62	10	21
Shipping and/or receiving clerk	5,060	.46	7	38
Weigher, record-keeping	1,880	.17	15	6
Stock clerk, stockroom, warehouse or storage yard	6,600	.60	13	22
All other plant clerical workers	4,860	.44	n.a.	n.a.
SALES OCCUPATIONS				
Sales representative, sales agent, and/or sales associate	8,240	.74	n.a.	n.a.
Sales representative, sales agent, and/or sales associate	7,600	.69	9	32
All other sales workers	640	.05	n.a.	n.a.

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Primary and Secondary Nonferrous Metals

This industry group engages in the smelting, refining, rolling, and drawing of primary and secondary metals, the extruding of nonferrous metals, and the operation of nonferrous foundries.

In 1977, the industry employed 86,300 workers or 0.4 percent of all workers employed in manufacturing. Employment declined 1 percent between 1971 and 1977.

The most populous occupations in the primary and

secondary nonferrous metals industry, as shown in table 18, were: Nonworking supervisors for production and other blue-collar occupations, with 5,500 workers or 6 percent of total industry employment; pot tenders, 2,500; and electricians, 2,100.

The occupational distribution of employment is shown in chart 15.

Chart 15. Primary and secondary nonferrous metals: Distribution of employment by major occupational group, 1971 and 1977

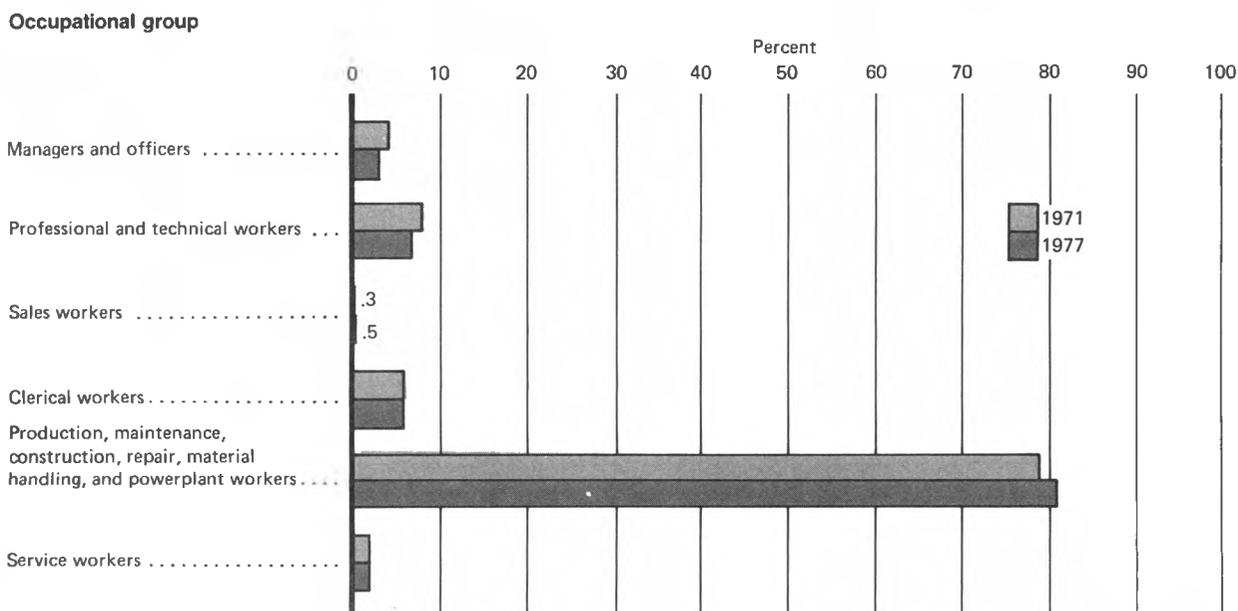


Table 18. Primary and secondary nonferrous metals: Employment, relative standard error, and percent of establishments reporting selected occupations, April 1977

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
TOTAL	86,330	100.00	-	100
MANAGERS AND OFFICERS	3,840	4.45	16	94
PROFESSIONAL OCCUPATIONS	4,670	5.35	n.a.	n.a.
Chemical engineer	170	.19	37	13
Civil engineer	80	.09	31	10
Electrical and/or electronic engineer	480	.55	23	23
Industrial engineer	160	.18	44	21
Mechanical engineer	590	.68	15	28
Metallurgist and/or metallurgical engineer	400	.46	29	31
Safety engineer	70	.08	28	16
All other engineers	210	.24	n.a.	n.a.
Chemist	470	.54	19	38
Systems analyst, electronic data processing	210	.24	34	13
Purchasing agent and/or buyer	320	.37	11	40
Accountant and/or auditor	720	.83	25	41
Nurse,professional	150	.17	22	18
Personnel and labor relations specialists	230	.26	26	28
All other professional workers	410	.47	n.a.	n.a.
TECHNICAL OCCUPATIONS	2,090	2.39	n.a.	n.a.
Computer programmer	70	.08	28	13
Drafter	310	.35	25	21
Electrical and/or electronic technician	200	.23	31	8
Spectroscopist	350	.40	26	21
All other engineering technicians	460	.53	n.a.	n.a.
Science technicians	180	.20	45	8
All other technicians	520	.60	n.a.	n.a.
SERVICE OCCUPATIONS	1,990	2.28	n.a.	n.a.
Janitor, porter, and/or cleaner	1,110	1.28	44	44
Guard and/or doorkeeper	730	.84	26	26
Food service workers	60	.06	n.a.	n.a.
All other service workers	90	.10	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	67,910	78.51	n.a.	n.a.
All other mechanics and repairers	4,520	5.23	n.a.	n.a.
Truck driver	1,290	1.49	36	51
Blacksmith	80	.09	40	11
Carpenter	280	.32	37	18
Crane, derrick, and/or hoist operator	1,660	1.92	30	27
Electrician	2,140	2.48	26	35
Supervisor, nonworking	5,540	6.42	23	59
Industrial truck operator	2,000	2.31	25	47
Inspector	240	.27	41	8
Machinist	800	.92	48	19
Maintenance repairer, general utility	1,460	1.69	33	42
Oiler	310	.35	30	19
Painter, maintenance	180	.20	25	18
Plumber and/or pipefitter	580	.67	35	17
Production packager, hand or machine	500	.57	32	15
Refractory materials repairer	560	.64	31	18
Caster, ingots and pigs	1,020	1.18	32	34
Drier tender, metal scrap	120	.13	26	8
Dust operator and/or ore crushing dust collector	250	.28	47	12
Kettle tender, nonferrous metal	300	.34	35	19
Pot liner	750	.86	41	10
Pot tender	2,470	2.86	38	13
Sampler and/or test preparer	240	.27	47	18
Skimmer, reverberatory	400	.46	37	10
Tester	280	.32	45	10
Furnace operator and/or cupola tender	1,790	2.07	21	50
Furnace charger	660	.76	34	24
Furnace operator helper or heater helper	900	1.04	21	27
Green anode processor	220	.25	48	9
Scrap sorter	550	.63	27	23
Mill and/or grinder operator, minerals	340	.39	33	14

See footnotes at end of table.

Table 18. Primary and secondary nonferrous metals: Employment, relative standard error, and percent of establishments reporting selected occupations, April 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Weigher, production	130	0.15	40	13
Tapper, metal	840	.97	46	22
All other skilled craft and kindred workers	4,030	4.67	n.a.	n.a.
All other operatives and semiskilled workers	20,920	24.24	n.a.	n.a.
All other laborers and unskilled workers	9,560	11.07	n.a.	n.a.
CLERICAL OCCUPATIONS				
Computer operator	5,530	6.28	n.a.	n.a.
Key punch operator	120	.13	21	17
All other office machine operators	150	.17	22	15
Stenographer	80	.09	n.a.	n.a.
Accounting clerk	160	.18	34	15
Bookkeeper, hand	450	.52	20	36
File clerk	80	.09	28	12
General clerk, office	60	.06	47	10
Order clerk	400	.46	24	30
Payroll and/or timekeeping clerk	100	.11	32	10
Personnel clerk	210	.24	15	30
Procurement clerk	70	.08	29	16
Secretary	90	.10	33	17
Statistical clerk	1,170	1.35	27	52
Switchboard operator-receptionist	90	.10	42	9
Typist	150	.17	14	35
Clerical supervisor, office or plant	220	.25	33	23
All other office clerical workers	250	.28	22	17
Production clerk and/or coordinator	170	.19	n.a.	n.a.
Shipping packer	360	.41	29	27
Shipping and/or receiving clerk	310	.35	38	7
Weigher, record-keeping	240	.27	26	32
Stock clerk, stockroom, warehouse or storage yard	100	.11	27	18
All other plant clerical workers	320	.37	33	27
	180	.20	n.a.	n.a.
SALES OCCUPATIONS				
Sales representative, sales agent, and/or sales associate	300	.34	n.a.	n.a.
All other sales workers	280	.32	19	24
	20	.02	n.a.	n.a.

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Fabricated Metal Products

This industry group includes establishments manufacturing metal products such as cans, tinware, cutlery, general hardware, nonelectrical heating apparatus, fabricated structural metal, forgings, stampings, ordnance, and other assorted wire and metal items.

In 1977, the industry employed 1.6 million workers or 8 percent of all workers employed in manufacturing. From 1971 to 1977, employment in the industry increased 16 percent.

The most populous occupations in the fabricated metal industry, as shown in table 19, were: Assemblers, with 135,100 workers or 8 percent of total industry employment; welders and flamecutters, 89,100; punch press operators (metal), 84,500; and nonworking supervisors for production and other blue-collar occupations, 59,300.

The occupational distribution of employment is shown in chart 16.

Chart 16. Fabricated metal products: Distribution of employment by major occupational group, 1971 and 1977

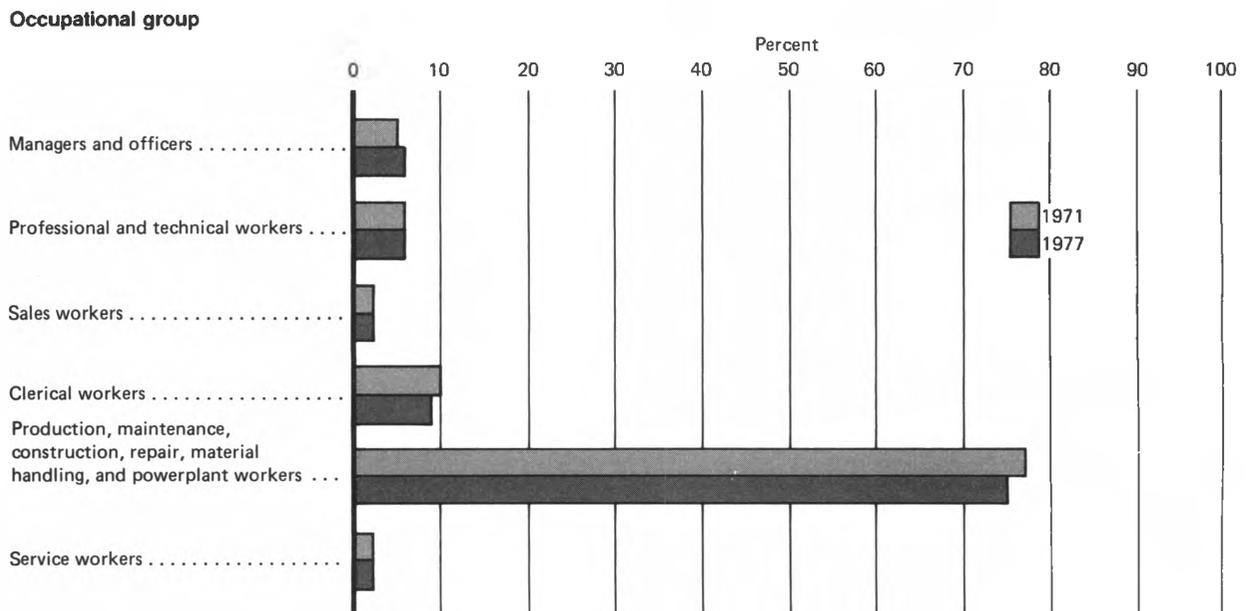


Table 19. Fabricated metal products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ June 1977

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
TOTAL	1,588,640	100.00	-	100
MANAGERS AND OFFICERS	90,880	5.72	2	89
PROFESSIONAL OCCUPATIONS	65,850	4.06	n.a.	n.a.
Civil engineer	1,580	.09	13	2
Electrical and/or electronic engineer	1,670	.10	18	2
Industrial engineer	4,920	.30	6	10
Mechanical engineer	14,200	.89	5	19
All other engineers	6,310	.39	n.a.	n.a.
Mathematical scientist	230	.01	n.a.	n.a.
Chemist	1,110	.06	17	2
All other physical scientists	530	.03	n.a.	n.a.
Life scientist	40	.00	n.a.	n.a.
Systems analyst, electronic data processing	1,590	.10	9	4
Purchasing agent and/or buyer	7,280	.45	2	24
Accountant and/or auditor	9,800	.61	3	24
Cost estimator, engineering	5,740	.36	3	13
Nurse, professional	990	.06	4	4
Personnel and labor relations specialists	3,240	.20	3	11
Designer	1,810	.11	8	3
All other professional workers	4,810	.30	n.a.	n.a.
TECHNICAL OCCUPATIONS	33,350	2.05	n.a.	n.a.
Computer programmer	2,130	.13	5	6
Drafter	19,380	1.21	3	25
Electrical and/or electronic technician	1,400	.08	13	2
Mechanical engineering technician	1,920	.12	10	3
All other engineering technicians	5,560	.34	n.a.	n.a.
Science technicians	310	.01	n.a.	n.a.
All other technicians	2,650	.16	n.a.	n.a.
SERVICE OCCUPATIONS	27,290	1.70	n.a.	n.a.
Janitor, porter, and/or cleaner	18,440	1.16	3	36
Guard and/or doorkeeper	5,060	.31	6	5
Food service workers	430	.02	n.a.	n.a.
Supervisor, nonworking--service only	2,240	.14	9	3
All other service workers	1,120	.07	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	1,191,810	74.58	n.a.	n.a.
Mechanic, automotive	2,310	.14	5	5
Mechanic, maintenance	18,250	1.14	5	13
All other mechanics and repairers	3,550	.22	n.a.	n.a.
Truck driver	17,280	1.08	2	37
Automatic spring coiling machine operator	3,500	.22	12	1
Boilermaker	2,640	.16	19	1
Carpenter	3,320	.20	12	4
Crane, derrick, and/or hoist operator	7,980	.50	5	7
Delivery and/or route worker	1,040	.06	13	2
Electrician	9,090	.57	5	11
Filer, grinder, buffer, chipper, cleaner, and/or - polisher	25,400	1.59	4	16
Supervisor, nonworking	59,270	3.73	2	53
Glazier	1,500	.09	17	1
Heater, metal	2,070	.13	9	1
Rigger	1,720	.10	9	2
Industrial truck operator	24,890	1.56	4	17
Inspector	37,660	2.37	3	31
Machinist	23,540	1.48	4	18
Maintenance repairer, general utility	11,570	.72	3	17
Helper, trades	21,370	1.34	4	18
Metal fabricator	5,910	.37	12	2
Millwright	7,670	.48	6	7
Oiler	1,450	.09	6	3
Order filler	5,790	.36	6	5
Painter, maintenance	1,320	.08	9	3
Pourer, metal	1,280	.08	11	1
Electroplater	14,570	.91	5	12

See footnotes at end of table.

Table 19. Fabricated metal products: Employment, relative standard error, and percent of establishments reporting selected occupations, June 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Plumber and/or pipefitter	3,190	0.20	9	2
Press operator and/or plate printer	2,460	.15	11	2
Production packager, hand or machine	26,300	1.65	4	21
Roll forming machine operator	4,320	.27	7	4
Sandblaster and/or shotblaster	3,310	.20	6	6
Sheet metal worker	20,710	1.30	6	9
Structural-steel worker	4,110	.25	13	1
Tool and die maker	29,750	1.87	5	23
Die setter	1,880	.11	8	2
Die sinker	1,210	.07	13	1
Drill-press and/or boring-machine operator	22,180	1.39	4	17
Drop-hammer operator	2,990	.18	10	1
Forging press operator	4,510	.28	11	2
Forging and/or straightening-roll operator	1,000	.06	14	1
Grinding and/or abrading machine operator, metal	21,450	1.35	5	15
Header operator	5,080	.31	7	2
Heat treater, annealer, and/or temperer	4,210	.26	6	4
Lathe and/or turning machine operator, metal	28,930	1.82	4	16
Lay-out marker, metal	9,070	.57	4	14
Machine tool operator, combination	25,760	1.62	8	16
Machine tool operator, numerical-control	3,970	.24	9	4
Machine tool operator, toolroom	5,040	.31	7	4
Machine tool setter, metalworking	8,780	.55	6	10
Milling and/or planing machine operator	5,510	.34	6	4
Molder, bench and/or floor	980	.06	16	1
Molder, machine	1,520	.09	15	1
Plater helper	14,510	.91	5	9
Power-screwdriver operator	1,950	.12	17	1
Sawyer, metal	4,900	.30	5	7
Tester	6,760	.42	6	8
Wire drawer	1,810	.11	14	1
Woodworking-machine operator	1,480	.09	21	1
Painter, production	19,830	1.24	3	25
Die-casting machine operator, metal and/or die-casting setter	1,490	.09	16	1
Riveter, light	1,890	.11	10	2
Punch-press operator, metal	84,480	5.31	3	31
Punch-press setter, metal	7,540	.47	5	8
Shear and/or slitter operator, metal	13,160	.82	3	19
Shear and/or slitter setter	1,700	.10	8	3
Compression and/or injection-molding-machine operator, plastics	2,880	.18	13	1
Conveyor operator or tender	1,840	.11	17	1
Loading-machine-operator	1,360	.08	23	0
Dip plater, non-electrolytic	4,120	.25	10	4
Furnace operator and/or cupola tender	1,670	.10	10	2
Fitter, structural metal	15,040	.94	5	9
Multi-slide machine operator	1,880	.11	12	2
Bodymaker operator, tin can	2,530	.15	13	1
Wire weaver	1,800	.11	22	1
Power brake and/or bending machine operator, metal	17,350	1.09	4	18
Welder and/or flamecutter -a	24,600	1.54	4	16
Welder and/or flamecutter -b	46,780	2.94	5	22
Welder and/or flamecutter -c	17,740	1.11	5	12
Assembler, class A	15,860	.99	7	8
Assembler, class B	34,470	2.16	6	13
Assembler, class C	84,790	5.33	4	19
All other skilled craft and kindred workers	25,200	1.58	n.a.	n.a.
All other operatives and semiskilled workers	64,620	4.06	n.a.	n.a.
All other laborers and unskilled workers	101,620	6.39	n.a.	n.a.
CLERICAL OCCUPATIONS				
Bookkeeping and/or billing machine operator	1,800	.11	5	6
Computer operator	2,460	.15	4	8
Keypunch operator	3,880	.24	3	8
All other office machine operators	1,230	.07	n.a.	n.a.

See footnotes at end of table.

Table 19. Fabricated metal products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ June 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
CLERICAL OCCUPATIONS—Continued				
Stenographer	2,440	0.15	6	5
Accounting clerk	10,640	.66	3	22
Bookkeeper, hand	8,170	.51	3	29
File clerk	2,220	.13	6	6
General clerk, office	20,090	1.26	2	39
Order clerk	4,030	.25	4	8
Payroll and/or timekeeping clerk	5,370	.33	2	16
Personnel clerk	1,900	.11	3	8
Procurement clerk	1,950	.12	5	6
Secretary	20,190	1.27	3	43
Switchboard operator-receptionist	3,560	.22	2	17
Typist	6,200	.39	4	11
Clerical supervisor, office or plant	3,140	.19	6	6
All other office clerical workers	7,230	.45	n.a.	n.a.
Production clerk and/or coordinator	9,960	.62	3	16
Shipping packer	10,540	.66	4	14
Shipping and/or receiving clerk	10,010	.63	3	24
Stock clerk, stockroom, warehouse or storage yard	9,550	.60	3	16
All other plant clerical workers	3,480	.21	n.a.	n.a.
SALES OCCUPATIONS	29,420	1.84	14	35
Sales representative, sales agent, and/or sales associate	28,400	1.78	4	33
Sales clerk	1,020	.06	10	2

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Machinery, Except Electrical

This industry group includes establishments manufacturing machinery and equipment, other than electrical and transportation equipment.

In 1977, the industry employed 2.2 million workers or 11 percent of all workers employed in manufacturing. From 1971 to 1977, employment in the industry increased 17 percent.

The most populous occupations in the machinery in-

dustry, as shown in table 20, were: Welders and flame-cutters, with 111,800 workers or 5 percent of total industry employment; class C assemblers, 101,800; machine tool operators, (combination), 70,600; and lathe operators, 69,000.

The occupational distribution of employment is shown in chart 17.

Chart 17. Machinery except electrical: Distribution of employment by major occupational group, 1971 and 1977

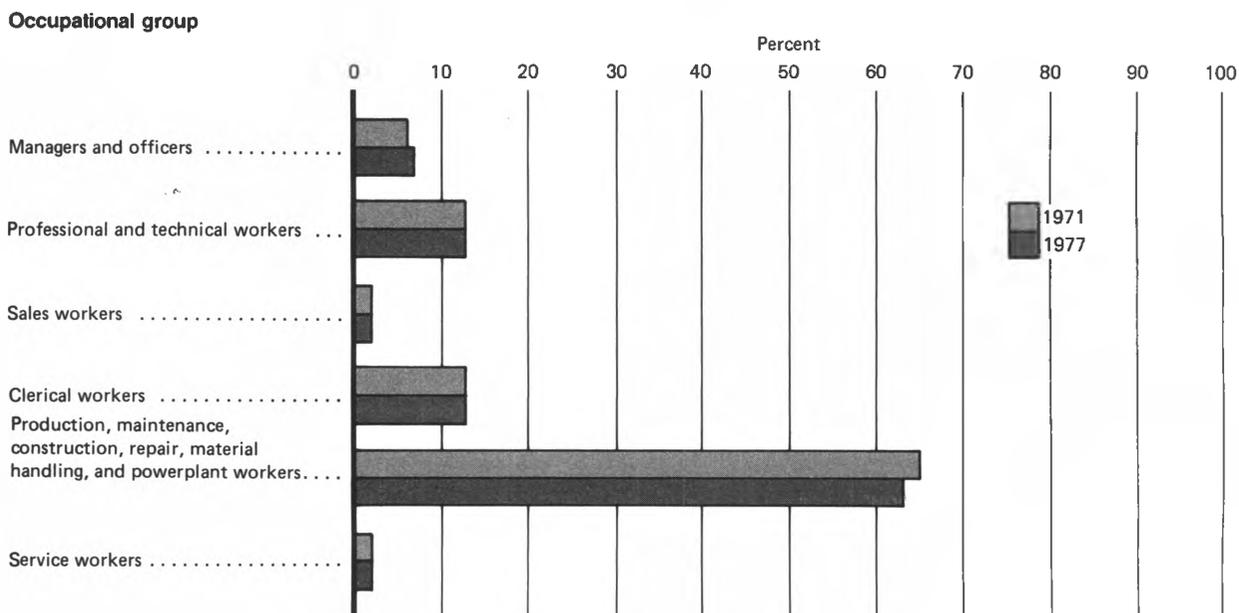


Table 20. Machinery, except electrical: Employment, relative standard error, and percent of establishments reporting selected occupations, June 1977

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
TOTAL	2,174,070	100.00	-	100
MANAGERS AND OFFICERS	156,480	7.19	4	64
PROFESSIONAL OCCUPATIONS	176,570	8.03	n.a.	n.a.
Civil engineer	1,350	.06	23	1
Electrical and/or electronic engineer	28,740	1.32	15	6
Industrial engineer	15,150	.69	12	10
Mechanical engineer	33,170	1.52	6	16
All other engineers	17,280	.79	n.a.	n.a.
Mathematical scientist	410	.01	n.a.	n.a.
Physical scientists	1,280	.05	n.a.	n.a.
Life scientist	40	.00	n.a.	n.a.
Social scientist	50	.00	n.a.	n.a.
Systems analyst, business	4,700	.21	10	3
Systems analyst, scientific and technical	3,390	.15	19	1
Purchasing agent and/or buyer	14,230	.65	3	15
Accountant and/or auditor	20,590	.94	5	20
Commercial artist	1,410	.06	11	2
Writer and/or editor	3,150	.14	8	2
Nurse, professional	1,610	.07	7	2
Personnel and labor relations specialists	5,730	.26	5	6
Designer	8,580	.39	9	4
All other professional workers	15,710	.72	n.a.	n.a.
TECHNICAL OCCUPATIONS	116,110	5.29	n.a.	n.a.
Computer programmer, business	8,430	.38	23	5
Computer programmer, scientific and technical	10,080	.46	24	1
Drafter	34,210	1.57	4	20
Electrical and/or electronic technician	29,530	1.35	11	6
Mechanical engineering technician	8,810	.40	11	3
Tool programmer, numerical control	3,730	.17	9	4
Industrial engineering technician	6,020	.27	10	3
All other engineering technicians	9,800	.45	n.a.	n.a.
Science technicians	570	.02	n.a.	n.a.
All other technicians	4,930	.22	n.a.	n.a.
SERVICE OCCUPATIONS	36,770	1.67	n.a.	n.a.
Janitor, porter, and/or cleaner	27,130	1.24	3	28
Guard and/or doorkeeper	5,120	.23	8	3
Food service workers	680	.03	n.a.	n.a.
Supervisor, nonworking--service only	2,720	.12	12	2
All other service workers	1,120	.05	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	1,368,450	62.58	n.a.	n.a.
Mechanic, automotive	2,290	.10	14	2
Mechanic, maintenance	12,110	.55	8	6
Refrigeration mechanic and/or air conditioning - mechanic	1,320	.06	18	1
All other mechanics and repairers	7,990	.36	n.a.	n.a.
Truck driver	7,400	.34	6	9
Carpenter	2,980	.13	11	3
Crane, derrick, and/or hoist operator	6,060	.27	11	2
Electrician	11,020	.50	6	7
Filer, grinder, buffer, chipper, cleaner, and/or - polisher	21,970	1.01	6	10
Supervisor, nonworking	68,150	3.13	3	29
Gear cutting, gear grinding and/or gear shaping machine operator	6,210	.28	12	3
Rigger	1,710	.07	17	1
Industrial truck operator	24,640	1.13	6	12
Inspector	50,370	2.31	5	16
Machinist	58,560	2.69	6	22
Maintenance repairer, general utility	11,040	.50	6	8
Helper, trades	7,110	.32	13	3
Millwright	5,180	.23	11	3
Oiler	1,340	.06	9	2
Order filler	7,340	.33	9	3

See footnotes at end of table.

Table 20. Machinery, except electrical: Employment, relative standard error, and percent of establishments reporting selected occupations, June 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Painter, maintenance	1,770	0.08	9	2
Electroplater	1,820	.08	14	1
Plumber and/or pipefitter	4,420	.20	13	2
Production packager, hand or machine	7,400	.34	17	3
Sandblaster and/or shotblaster	2,980	.13	8	3
Sheet metal worker	20,730	.95	10	7
Tool and die maker	54,960	2.52	5	23
Coremaker, hand, bench and/or floor	1,330	.06	16	1
Drill-press and/or boring-machine operator	50,350	2.31	5	20
Etcher and/or engraver	1,470	.06	29	1
Grinding and/or abrading machine operator, metal	49,410	2.27	6	18
Heat treater, annealer, and/or temperer	4,920	.22	9	3
Lathe and/or turning machine operator, metal	69,040	3.17	4	25
Lay-out marker, metal	4,850	.22	13	3
Machine tool operator, combination	70,580	3.24	5	25
Machine tool operator, numerical-control	26,690	1.22	7	12
Machine tool operator, toolroom	11,610	.53	9	5
Machine tool setter, metalworking	15,670	.72	8	8
Milling and/or planing machine operator	36,940	1.69	5	17
Molder, bench and/or floor	1,960	.09	19	1
Molder, machine	2,860	.13	22	1
Patternmaker, metal	3,040	.13	26	1
Patternmaker, wood	3,020	.13	21	2
Sawyer, metal	4,150	.19	7	5
Shakeout worker, foundry	1,420	.06	19	1
Tester	8,150	.37	9	4
Painter, production	14,020	.64	5	13
Die-casting machine operator, metal and/or die-casting setter	1,670	.07	35	0
Punch-press operator, metal	22,110	1.01	6	10
Punch-press setter, metal	2,930	.13	11	2
Shear and/or slitter operator, metal	4,290	.19	7	4
Coil winder	2,210	.10	25	1
Compression and/or injection-molding-machine operator, plastics	2,000	.09	26	1
Conveyor operator or tender	1,690	.07	45	0
Furnace operator and/or cupola tender	1,460	.06	14	1
Power brake and/or bending machine operator, metal	7,260	.33	7	4
Welder and/or flamecutter -a	36,880	1.69	6	14
Welder and/or flamecutter -b	48,020	2.20	6	15
Welder and/or flamecutter -c	26,860	1.23	8	8
Machine assembler, class A	40,910	1.88	8	8
Electro-mechanical equipment assembler, class A	5,450	.25	15	1
Electrical and electronic assembler, class A	14,210	.65	14	3
All other assemblers, class A	10,950	.50	n.a.	n.a.
Machine assembler, class B	24,010	1.10	12	5
Electro-mechanical assembler, class B	12,590	.57	15	2
Electrical and electronic assembler, class B	29,970	1.37	12	4
All other assemblers, class B	26,040	1.19	n.a.	n.a.
Assembler, class C	101,820	4.68	6	12
All other skilled craft and kindred workers	33,210	1.52	n.a.	n.a.
All other operatives and semiskilled workers	62,720	2.88	n.a.	n.a.
All other laborers and unskilled workers	58,840	2.70	n.a.	n.a.
CLERICAL OCCUPATIONS	279,890	12.74	n.a.	n.a.
Bookkeeping and/or billing machine operator	1,490	.06	9	3
Computer operator	5,850	.26	8	5
Keypunch operator	8,430	.38	6	6
All other office machine operators	3,520	.16	n.a.	n.a.
Stenographer	5,380	.24	8	3
Accounting clerk	17,030	.78	5	11
Bookkeeper, hand	2,440	.11	8	5
File clerk	4,220	.19	10	4
General clerk, office	35,580	1.63	5	32
Order clerk	6,680	.30	8	5
Payroll and/or timekeeping clerk	6,920	.31	7	9

See footnotes at end of table.

Table 20. Machinery, except electrical: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ June 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
CLERICAL OCCUPATIONS—Continued				
Personnel clerk	2,880	0.13	5	5
Procurement clerk	4,190	.19	5	6
Secretary	43,900	2.01	4	34
Statistical clerk	2,310	.10	10	2
Switchboard operator-receptionist	4,140	.19	3	10
Typist	14,130	.64	7	7
Clerical supervisor, office or plant	8,630	.39	8	5
All other office clerical workers	16,790	.77	n.a.	n.a.
Production clerk and/or coordinator	26,230	1.20	5	15
Shipping packer	10,410	.47	5	8
Shipping and/or receiving clerk	12,640	.58	5	13
Stock clerk, stockroom, warehouse or storage yard	29,750	1.36	5	20
All other plant clerical workers	6,350	.29	n.a.	n.a.
SALES OCCUPATIONS	39,800	1.82	n.a.	n.a.
Sales representative, sales agent, and/or sales associate	38,580	1.77	4	20
All other sales workers	1,220	.05	n.a.	n.a.

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Electrical and Electronic Equipment

This industry group includes establishments manufacturing machinery, apparatus, and supplies for the generation, storage, transmission, transformation, and utilization of electrical energy.

In 1977, the industry employed 1.9 million workers or 10 percent of all workers employed in manufacturing. From 1971 to 1977, employment in the industry increased 6 percent.

The most populous occupations in the electrical and electronic equipment industry, as shown in table 21, were: Class C assemblers, with 275,000 workers or 15 percent of total industry employment; electrical and electronic assemblers, 107,900; electrical and electronic engineers, 77,500; and inspectors, 64,300.

The occupational distribution of employment is shown in chart 18.

Chart 18. Electric and electronic equipment: Distribution of employment by major occupational group, 1971 and 1977

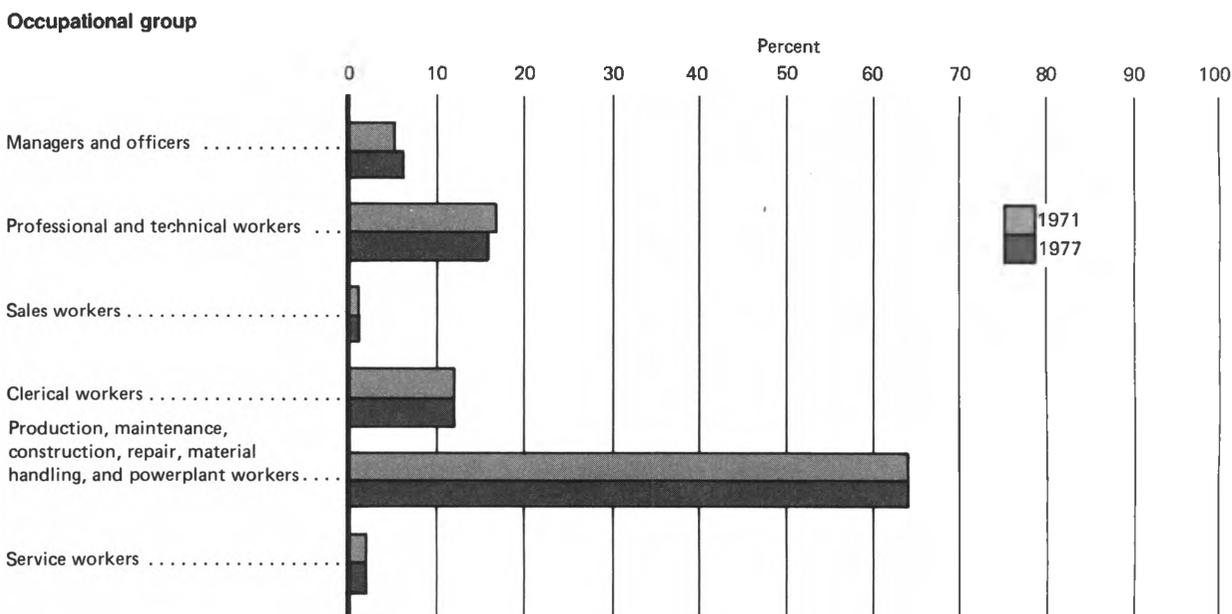


Table 21. Electric and electronic equipment: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ June 1977

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
TOTAL	1,882,730	100.00	-	100
MANAGERS AND OFFICERS	105,240	5.58	3	44
PROFESSIONAL OCCUPATIONS	202,780	10.67	n.a.	n.a.
Chemical engineer	1,710	.09	16	3
Electrical and/or electronic engineer	77,520	4.11	3	22
Industrial engineer	10,660	.56	8	11
Mechanical engineer	14,920	.79	10	13
All other engineers	22,740	1.20	n.a.	n.a.
Mathematical scientist	1,780	.09	n.a.	n.a.
Physical scientists	2,120	.11	n.a.	n.a.
Life scientist	60	.00	n.a.	n.a.
Social scientist	1,880	.09	n.a.	n.a.
Systems analyst, business	4,300	.22	9	5
Systems analyst,scientific and technical	2,480	.13	11	2
Purchasing agent and/or buyer	9,650	.51	4	20
Accountant and/or auditor	14,220	.75	6	16
Commercial artist	1,910	.10	11	3
Writer and/or editor	4,330	.22	16	5
Nurse,professional	1,430	.07	4	6
Personnel and labor relations specialists	5,240	.27	6	12
Designer	6,440	.34	9	6
All other professional workers	19,390	1.02	n.a.	n.a.
TECHNICAL OCCUPATIONS	102,310	5.40	n.a.	n.a.
Computer programmer,business	4,000	.21	7	7
Computer programmer,scientific and technical	2,560	.13	13	2
Drafter	17,290	.91	4	19
Electrical and/or electronic technician	49,920	2.65	5	21
Mechanical engineering technician	6,130	.32	10	5
Industrial engineering technician	3,230	.17	11	5
All other engineering technicians	10,580	.56	n.a.	n.a.
Science technicians	2,180	.11	12	2
All other technicians	6,420	.34	n.a.	n.a.
SERVICE OCCUPATIONS	28,500	1.50	n.a.	n.a.
Janitor, porter, and/or cleaner	17,530	.93	5	21
Guard and/or doorkeeper	6,040	.32	9	5
Food service workers	1,090	.05	n.a.	n.a.
Supervisor,nonworking--service only	2,520	.13	12	3
All other service workers	1,320	.07	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR,MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	1,201,160	63.41	n.a.	n.a.
Electric-motor repairer	1,500	.07	19	1
Electrical instrument repairer	2,440	.12	17	2
Mechanic, maintenance	13,430	.71	7	9
All other mechanics and repairers	6,020	.31	n.a.	n.a.
Truck driver	4,420	.23	8	8
Carpenter	1,670	.08	8	4
Crane, derrick, and/or hoist operator	1,780	.09	17	1
Electrician	9,500	.50	7	9
Filer, grinder, buffer, chipper, cleaner, and/or - polisher	6,480	.34	14	3
Supervisor, nonworking	53,580	2.84	5	27
Gear cutting, gear grinding and/or gear shaping machine operator	1,260	.06	16	1
Industrial truck operator	11,880	.63	6	7
Inspector	64,280	3.41	6	21
Machinist	14,090	.74	8	12
Maintenance repairer, general utility	11,440	.60	7	14
Helper,trades	2,280	.12	9	4
Millwright	3,810	.20	11	3
Order filler	6,450	.34	11	4
Painter, maintenance	1,390	.07	12	3
Electroplater	8,720	.46	16	5
Plumber and/or pipefitter	2,920	.15	11	3
Press operator and/or plate printer	1,770	.09	20	2

See footnotes at end of table.

Table 21. Electric and electronic equipment: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ June 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Production packager, hand or machine	16,550	0.87	8	7
Sheet metal worker	6,900	.36	12	6
Stationary engineer	1,170	.06	13	1
Tool and die maker	17,030	.90	8	12
Drill-press and/or boring-machine operator	11,710	.62	8	8
Etcher and/or engraver	3,230	.17	45	2
Grinding and/or abrading machine operator, metal	6,330	.33	10	5
Heat treater, annealer, and/or temperer	1,480	.07	14	2
Lathe and/or turning machine operator, metal	10,810	.57	11	7
Machine tool operator, combination	14,340	.76	13	8
Machine tool operator, numerical-control	5,570	.29	12	4
Machine tool operator, toolroom	5,080	.26	17	4
Machine tool setter, metalworking	6,690	.35	10	5
Milling and/or planing machine operator	3,470	.18	10	3
Molder, machine	1,270	.06	25	1
Plater helper	3,920	.20	35	3
Power-screwdriver operator	1,470	.07	34	1
Tester	26,540	1.40	8	10
Painter, production	10,000	.53	8	12
Die-casting machine operator, metal and/or die-casting setter	3,370	.17	16	2
Wired, electronic	22,940	1.21	10	7
Impregnator, electronic	1,790	.09	14	2
Riveter, light	2,410	.12	21	1
Punch-press operator, metal	23,640	1.25	8	10
Punch-press setter, metal	2,950	.15	9	4
Shear and/or slitter operator, metal	1,940	.10	10	3
Coil winder	24,360	1.29	8	9
Coil taper, hand or machine	3,030	.16	20	2
Encapsulator	2,280	.12	14	3
Compression and/or injection-molding-machine operator, plastics	17,520	.93	11	4
Coil finisher	6,280	.33	16	2
Conveyor operator or tender	7,350	.39	34	1
Dip plater, non-electrolytic	3,660	.19	41	2
Furnace operator and/or cupola tender	1,290	.06	23	1
Power brake and/or bending machine operator, metal	2,670	.14	21	3
Screen or stencil printer and/or setter	5,860	.31	21	3
Welder and/or flamecutter -a	4,410	.23	12	4
Welder and/or flamecutter -b	5,480	.29	11	4
Welder and/or flamecutter -c	6,210	.32	12	4
Machine assembler, class A	6,440	.34	24	1
Instrument maker, class A	1,330	.07	18	1
Electro-mechanical equipment assembler, class A	7,710	.40	17	3
Electrical and electronic assembler, class A	27,710	1.47	12	7
All other assemblers, class A	20,280	1.07	n.a.	n.a.
Machine assembler, class B	10,340	.54	20	2
Instrument assembler, class B	2,800	.14	30	1
Electro-mechanical assembler, class B	7,000	.37	15	2
Electrical and electronic assembler, class B	80,140	4.25	6	12
All other assemblers, class B	37,580	1.99	n.a.	n.a.
Assembler, class C	275,030	14.60	3	21
Mixer and/or blender, chemicals and chemical products	2,700	.14	16	3
All other skilled craft and kindred workers	21,790	1.15	n.a.	n.a.
All other operatives and semiskilled workers	89,940	4.77	n.a.	n.a.
All other laborers and unskilled workers	76,260	4.05	n.a.	n.a.
CLERICAL OCCUPATIONS	222,600	11.70	n.a.	n.a.
Computer operator	4,530	.24	8	8
Keypunch operator	6,480	.34	5	9
Peripheral EDP equipment operator	1,130	.06	14	2
All other office machine operators	3,370	.17	n.a.	n.a.
Stenographer	4,230	.22	10	5
Accounting clerk	12,680	.67	5	16
Bookkeeper, hand	2,020	.10	9	7

See footnotes at end of table.

Table 21. Electric and electronic equipment: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ June 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
CLERICAL OCCUPATIONS—Continued				
File clerk	2,980	0.15	9	6
General clerk, office	22,560	1.19	6	21
Order clerk	6,730	.35	7	8
Payroll and/or timekeeping clerk	4,900	.26	5	14
Personnel clerk	2,880	.15	5	10
Procurement clerk	3,220	.17	5	10
Secretary	35,560	1.88	5	30
Statistical clerk	2,070	.10	8	5
Switchboard operator	1,480	.07	9	5
Switchboard operator-receptionist	2,830	.15	4	14
Typist	11,260	.59	6	12
Clerical supervisor, office or plant	7,800	.41	8	10
All other office clerical workers	16,640	.88	n.a.	n.a.
Production clerk and/or coordinator	19,770	1.05	8	19
Shipping packer	11,040	.58	6	13
Shipping and/or receiving clerk	11,490	.61	3	26
Stock clerk, stockroom, warehouse or storage yard	19,000	1.00	5	20
All other plant clerical workers	5,950	.31	n.a.	n.a.
SALES OCCUPATIONS	20,140	1.06	n.a.	n.a.
Sales representative, sales agent, and/or sales associate	19,060	1.01	8	17
All other sales workers	1,080	.05	n.a.	n.a.

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Transportation Equipment

This industry group includes establishments manufacturing equipment for transportation of passengers and cargo by land, air, and water.

In 1977, the industry employed 1.9 million workers or 10 percent of all workers employed in manufacturing. From 1971 to 1977, employment in the industry increased 8 percent.

The most populous occupations in the transportation

equipment industry, as shown in table 22, were: Class C assemblers, with 214,200 or 11 percent of total industry employment; welders and flamecutters, 102,100; inspectors, 76,300; and nonworking supervisors for production and other blue-collar occupations, 73,300.

The occupational distribution of employment is shown in chart 19.

Chart 19. Transportation equipment: Distribution of employment by major occupational group, 1971 and 1977

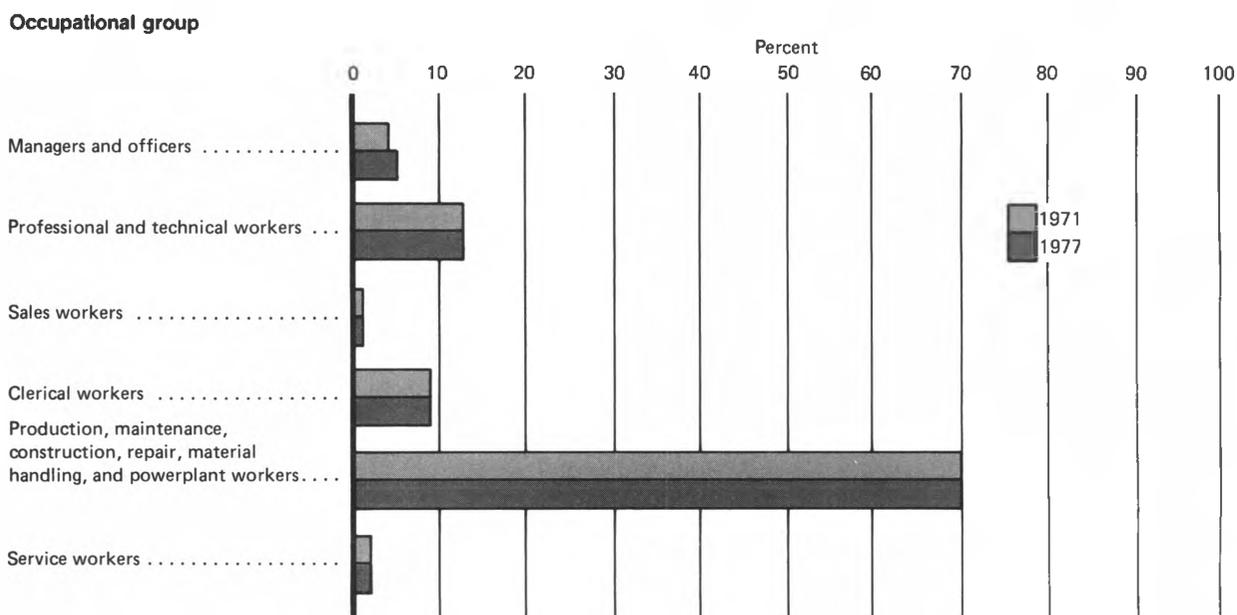


Table 22. Transportation equipment: Employment, relative standard error, and percent of establishments reporting selected occupations, June 1977

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
TOTAL	1,889,390	100.00	-	100
MANAGERS AND OFFICERS	86,900	4.59	7	93
PROFESSIONAL OCCUPATIONS	194,140	10.19	n.a.	n.a.
Aeronautical engineer	35,020	1.85	1	5
Electrical and/or electronic engineer	8,720	.46	25	9
Industrial engineer	11,000	.58	12	20
Mechanical engineer	17,690	.93	16	23
Metallurgist and/or metallurgical engineer	1,490	.07	33	5
All other engineers	37,160	1.96	n.a.	n.a.
Statistician	3,010	.15	29	4
All other mathematical scientists	500	.02	n.a.	n.a.
Physical scientists	1,950	.10	n.a.	n.a.
Social scientist	570	.03	n.a.	n.a.
Systems analyst, business	3,640	.19	18	9
Purchasing agent and/or buyer	10,450	.55	10	50
Accountant and/or auditor	11,660	.61	11	32
Commercial artist	2,300	.12	20	6
Writer and/or editor	2,440	.12	31	7
Nurse,professional	1,610	.08	7	12
Personnel and labor relations specialists	6,100	.32	7	24
Designer	5,110	.27	26	9
All other professional workers	33,720	1.78	n.a.	n.a.
TECHNICAL OCCUPATIONS	56,780	2.96	n.a.	n.a.
Computer programmer,business	3,270	.17	14	12
Computer programmer,scientific and technical	1,300	.06	28	4
Drafter	10,150	.53	12	24
Electrical and/or electronic technician	7,490	.39	31	7
Mechanical engineering technician	11,050	.58	20	8
Tool programmer,numerical control	1,410	.07	17	5
Industrial engineering technician	2,350	.12	20	10
All other engineering technicians	11,960	.63	n.a.	n.a.
Science technicians	1,340	.07	38	3
All other technicians	6,460	.34	n.a.	n.a.
SERVICE OCCUPATIONS	44,280	2.31	n.a.	n.a.
Janitor, porter, and/or cleaner	25,980	1.37	8	46
Guard and/or doorkeeper	10,740	.56	11	16
Food service workers	740	.03	n.a.	n.a.
Supervisor,nonworking--service only	2,450	.12	14	9
All other service workers	4,370	.23	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR,MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	1,330,380	70.03	n.a.	n.a.
Mechanic, aircraft	13,920	.73	27	3
Mechanic, automotive	6,450	.34	12	17
Mechanic, maintenance	18,440	.97	12	19
All other mechanics and repairers	8,850	.46	n.a.	n.a.
Truck driver	7,890	.41	7	39
Boilermaker	2,760	.14	21	2
Carpenter	10,770	.57	7	29
Crane, derrick, and/or hoist operator	5,880	.31	10	13
Electrician	26,170	1.38	17	30
Filer, grinder, buffer, chipper, cleaner, and/or - polisher	23,510	1.24	12	21
Supervisor, nonworking	73,310	3.88	7	57
Gear cutting, gear grinding and/or gear shaping machine operator	3,600	.19	25	4
Rigger	3,520	.18	15	4
Industrial truck operator	30,430	1.61	5	29
Inspector	76,270	4.03	6	36
Instrument repairer	2,230	.11	26	4
Machinist	16,560	.87	13	22
Maintenance repairer, general utility	5,600	.29	9	21
Helper,trades	9,230	.48	14	16
Millwright	11,410	.60	14	9
Oiler	2,530	.13	11	9

See footnotes at end of table.

Table 22. Transportation equipment: Employment, relative standard error, and percent of establishments reporting selected occupations, June 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Order filler	4,280	0.22	19	7
Painter, maintenance	2,730	.14	10	10
Electroplater	2,240	.11	14	5
Plumber and/or pipefitter	20,680	1.09	17	16
Production packager, hand or machine	5,230	.27	18	7
Sewing-machine operator, regular equipment- non-garment				
Sheet metal worker	3,050	.16	32	4
Stationary engineer	16,610	.87	12	18
Shipprigger	1,760	.09	15	6
Tool and die maker	3,580	.18	22	3
Drill-press and/or boring-machine operator	20,160	1.06	13	19
Fabricator, plastics	19,810	1.04	16	18
Forging press operator	1,970	.10	44	2
Grinding and/or abrading machine operator, metal	1,990	.10	34	2
Heat treater, annealer, and/or temperer	19,900	1.05	14	19
Lathe and/or turning machine operator, metal	4,160	.22	20	6
Lay-out marker, metal	21,480	1.13	15	18
Machine tool operator, combination	2,760	.14	21	6
Machine tool operator, numerical-control	32,070	1.69	7	18
Machine tool operator, toolroom	5,670	.30	17	7
Machine tool setter, metalworking	11,680	.61	15	10
Milling and/or planing machine operator	16,120	.85	19	10
Patternmaker, metal	12,980	.68	15	13
Sawyer, metal	1,290	.06	32	2
Shipfitter	1,610	.08	14	7
Shipwright	15,030	.79	17	6
Tester	1,710	.09	20	2
Woodworking-machine operator	10,020	.53	19	10
Painter, production	1,700	.08	15	6
Riveter, heavy	30,530	1.61	10	38
Riveter, light	1,320	.06	36	2
Punch-press operator, metal	2,380	.12	25	4
Punch-press setter, metal	29,660	1.56	7	19
Shear and/or slitter operator, metal	2,660	.14	15	7
Compression and/or injection-molding-machine operator, plastics	3,060	.16	18	9
Conveyor operator or tender	2,510	.13	35	2
Power brake and/or bending machine operator, metal	7,190	.38	33	2
Welder and/or flamecutter -a	5,960	.31	14	11
Welder and/or flamecutter -b	18,940	1.00	12	21
Welder and/or flamecutter -c	54,380	2.87	10	31
Machine assembler, class A	28,740	1.52	9	19
Electro-mechanical equipment assembler, class A	3,320	.17	21	4
Electrical and electronic assembler, class A	2,120	.11	48	2
All other assemblers, class A	4,560	.24	25	2
Machine assembler, class B	19,530	1.03	n.a.	n.a.
Electro-mechanical assembler, class B	7,270	.38	27	6
Electrical and electronic assembler, class B	5,070	.26	22	4
Aircraft structure and surfaces assembler, class B	5,240	.27	30	3
All other assemblers, class B	18,980	1.00	34	2
Assembler, class C	24,930	1.31	n.a.	n.a.
Laminator, preforms	214,200	11.33	1	34
All other skilled craft and kindred workers	10,160	.53	11	11
All other operatives and semiskilled workers	25,430	1.34	n.a.	n.a.
All other laborers and unskilled workers	106,660	5.64	n.a.	n.a.
	73,980	3.91	n.a.	n.a.
CLERICAL OCCUPATIONS				
Computer operator	165,870	8.68	n.a.	n.a.
Keypunch operator	2,700	.14	15	16
All other office machine operators	4,480	.23	7	18
Stenographer	4,730	.25	n.a.	n.a.
Accounting clerk	5,180	.27	14	10
Bookkeeper, hand	6,640	.35	7	30
File clerk	2,560	.13	15	14
General clerk, office	1,560	.08	14	8
	19,020	1.00	10	44

See footnotes at end of table.

Table 22. Transportation equipment: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ June 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
CLERICAL OCCUPATIONS—Continued				
Order clerk	2,170	0.11	14	12
Payroll and/or timekeeping clerk	3,750	.19	7	26
Personnel clerk	2,670	.14	31	15
Procurement clerk	2,540	.13	20	14
Secretary	21,170	1.12	11	56
Statistical clerk	2,140	.11	21	6
Switchboard operator-receptionist	1,310	.06	7	20
Typist	7,660	.40	18	21
Clerical supervisor, office or plant	3,680	.19	10	15
All other office clerical workers	10,180	.53	n.a.	n.a.
Production clerk and/or coordinator	19,920	1.05	13	31
Shipping packer	3,410	.18	14	13
Shipping and/or receiving clerk	10,350	.54	10	31
Stock clerk, stockroom, warehouse or storage yard	19,350	1.02	11	32
All other plant clerical workers	8,700	.46	n.a.	n.a.
SALES OCCUPATIONS				
Sales representative, sales agent, and/or sales associate	11,040	.57	n.a.	n.a.
All other sales workers	490	.02	n.a.	n.a.

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Instruments and Related Products

This industry group includes establishments manufacturing measuring, testing, analyzing, and controlling instruments; optical instruments and lenses; surveying and drafting instruments; surgical, medical, and dental supplies and equipment; ophthalmic goods; photographic equipment; and watches and clocks.

In 1977, the industry employed 618,900 workers or 3 percent of all workers employed in manufacturing. From 1971 to 1977, employment in the industry increased 29 percent.

The most populous occupations in the instruments industry, as shown in table 23, were: Class C assemblers, with 41,800 workers or 7 percent of total industry employment; electrical and electronic assemblers, 29,000; nonworking supervisors for production and other blue-collar occupations, 19,100; and electrical and electronic engineers, 17,500.

The occupational distribution of employment is shown in chart 20.

Chart 20. Instruments and related products: Distribution of employment by major occupational group, 1971 and 1977

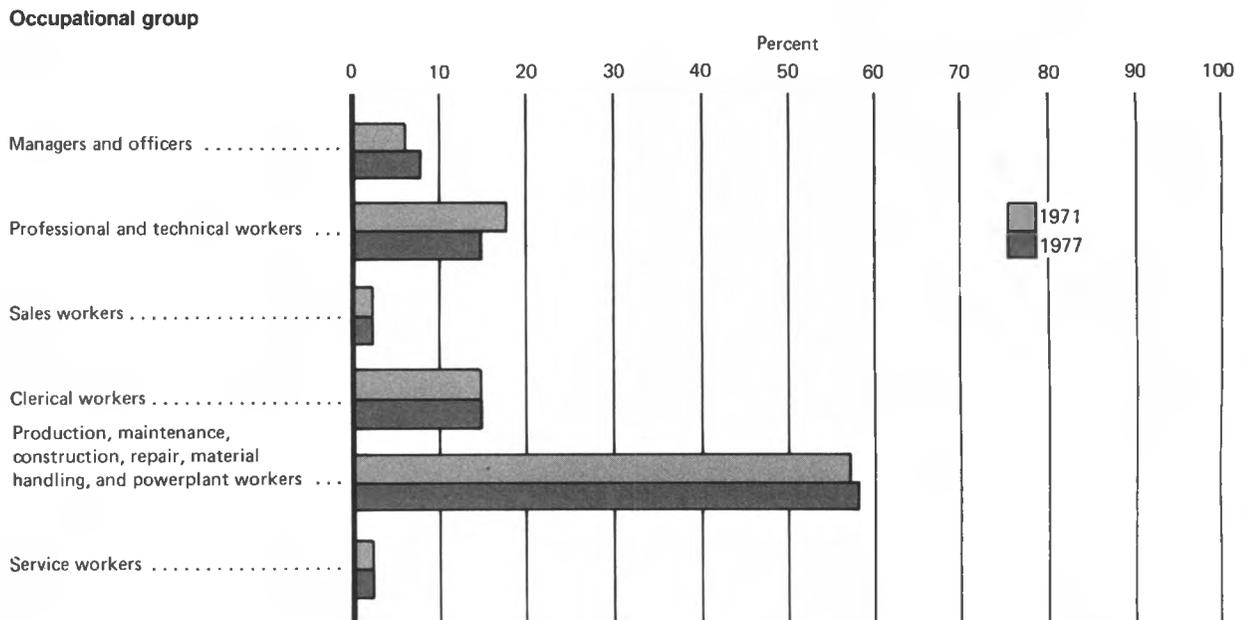


Table 23. Instruments and related products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ June 1977

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
TOTAL	618,870	100.00	-	100
MANAGERS AND OFFICERS	47,680	7.70	7	32
PROFESSIONAL OCCUPATIONS	56,680	9.08	n.a.	n.a.
Chemical engineer	1,000	.16	40	2
Electrical and/or electronic engineer	17,530	2.83	11	11
Industrial engineer	2,400	.38	9	5
Mechanical engineer	6,080	.98	15	7
All other engineers	7,290	1.17	n.a.	n.a.
Mathematical scientist	280	.04	n.a.	n.a.
Chemist	1,710	.27	23	3
All other physical scientists	660	.10	n.a.	n.a.
Life scientist	420	.06	27	1
Systems analyst, electronic data processing	1,490	.24	20	3
Purchasing agent and/or buyer	3,780	.61	6	12
Accountant and/or auditor	4,380	.70	11	9
Cost estimator, engineering	880	.14	12	3
Writer and/or editor	1,700	.27	14	3
Personnel and labor relations specialists	1,650	.26	11	6
Designer	1,570	.25	17	3
All other professional workers	3,860	.62	n.a.	n.a.
TECHNICAL OCCUPATIONS	37,200	5.95	n.a.	n.a.
Computer programmer	3,520	.56	20	4
Drafter	6,480	1.04	6	10
Electrical and/or electronic technician	12,420	2.00	12	7
Mechanical engineering technician	2,310	.37	11	4
Tool programmer,numerical control	420	.06	15	1
Industrial engineering technician	680	.10	28	2
All other engineering technicians	4,280	.69	n.a.	n.a.
Science technicians	2,760	.44	22	2
Prosthetist-orthotist	790	.12	21	1
All other technicians	3,540	.57	n.a.	n.a.
SERVICE OCCUPATIONS	9,950	1.58	n.a.	n.a.
Janitor, porter, and/or cleaner	7,570	1.22	13	13
Guard and/or doorkeeper	1,220	.19	35	2
Food service workers	380	.06	29	0
Supervisor,nonworking--service only	430	.06	18	2
All other service workers	350	.05	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR,MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	361,170	58.06	n.a.	n.a.
Mechanic, maintenance	3,150	.50	17	4
All other mechanics and repairers	2,630	.42	n.a.	n.a.
Truck driver	800	.12	14	3
Carpenter	420	.06	18	2
Electrician	1,170	.18	11	3
Filer, grinder, buffer, chipper, cleaner, and/or - polisher	3,650	.58	10	4
Supervisor, nonworking	19,100	3.08	17	16
Gear cutting, gear grinding and/or gear shaping machine operator	600	.09	18	1
Industrial truck operator	1,580	.25	17	2
Inspector	16,990	2.74	9	12
Instrument repairer	2,000	.32	21	2
Lens grinder	6,500	1.05	13	3
Machinist	7,600	1.22	8	8
Maintenance repairer, general utility	3,490	.56	13	8
Helper,trades	780	.12	14	2
Order filler	4,360	.70	8	8
Electroplater	820	.13	17	2
Plumber and/or pipefitter	440	.07	33	1
Production packager, hand or machine	11,410	1.84	11	7
Sewing-machine operator, regular equipment- non-garment	3,280	.52	18	2

See footnotes at end of table.

Table 23. Instruments and related products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ June 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Sewing-machine operator, special equipment and/or automatic equipment-nongarment	1,040	0.16	31	1
Sheet metal worker	1,340	.21	14	2
Tool and die maker	4,690	.75	8	7
Welder and/or flamecutter	4,160	.67	11	5
Optician, dispensing and/or optical mechanic	5,950	.96	16	2
Drill-press and/or boring-machine operator	5,230	.84	10	5
Grinding and/or abrading machine operator, metal	3,160	.51	12	4
Heat treater, annealer, and/or temperer	430	.06	16	1
Lathe and/or turning machine operator, metal	6,020	.97	10	6
Machine tool operator, combination	6,900	1.11	11	7
Machine tool operator, numerical-control	2,050	.33	13	3
Machine tool operator, toolroom	1,290	.20	14	3
Machine tool setter, metalworking	2,450	.39	9	4
Milling and/or planing machine operator	2,620	.42	16	3
Plater helper	460	.07	15	1
Tester	6,870	1.11	10	7
Painter, production	2,300	.37	11	4
Die-casting machine operator, metal and/or die-casting setter	520	.08	27	1
Wirer, electronic	3,580	.57	24	2
Punch-press operator, metal	4,260	.68	13	5
Punch-press setter, metal	760	.12	13	2
Compression and/or injection-molding-machine operator, plastics	4,920	.79	27	2
Conveyor operator or tender	440	.07	40	0
Dip plater, non-electrolytic	500	.08	32	1
Artificial-appliance maker	560	.09	27	1
Adhesive-bandage-machine operator	1,040	.16	39	0
Power brake and/or bending machine operator, metal	560	.09	26	1
Instrument maker, class A	2,270	.36	13	2
Electro-mechanical equipment assembler, class A	5,140	.83	13	3
Electrical and electronic assembler, class A	7,770	1.25	14	5
All other assemblers, class A	9,060	1.46	n.a.	n.a.
Instrument assembler, class B	14,540	2.34	13	4
Electro-mechanical assembler, class B	4,540	.73	16	2
Electrical and electronic assembler, class B	21,160	3.41	11	7
Clock, watch and chronometer assembler, class B	4,410	.71	25	1
All other assemblers, class B	17,560	2.83	n.a.	n.a.
Assembler, class C	41,780	6.75	11	10
Mixer and/or blender, chemicals and chemical products	1,340	.21	21	1
All other skilled craft and kindred workers	7,870	1.27	n.a.	n.a.
All other operatives and semiskilled workers	33,770	5.45	n.a.	n.a.
All other laborers and unskilled workers	25,090	4.05	n.a.	n.a.
CLERICAL OCCUPATIONS	92,410	14.82	n.a.	n.a.
Bookkeeping and/or billing machine operator	620	.10	12	2
Computer operator	1,580	.25	11	5
Keypunch operator	2,660	.42	12	5
All other office machine operators	1,490	.24	n.a.	n.a.
Stenographer	1,350	.21	15	2
Accounting clerk	6,530	1.05	6	13
Bookkeeper, hand	1,990	.32	7	10
File clerk	1,850	.29	37	4
General clerk, office	10,360	1.67	10	15
Order clerk	3,910	.63	7	7
Payroll and/or timekeeping clerk	1,800	.29	11	7
Personnel clerk	960	.15	8	5
Procurement clerk	1,630	.26	8	6
Receptionist	380	.06	13	2
Secretary	14,700	2.37	7	21
Statistical clerk	610	.09	30	2
Switchboard operator	500	.08	15	2
Switchboard operator-receptionist	1,530	.24	6	8
Typist	6,400	1.03	11	10

See footnotes at end of table.

Table 23. Instruments and related products: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ June 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
CLERICAL OCCUPATIONS—Continued				
Clerical supervisor, office or plant	3,190	0.51	10	5
All other office clerical workers	2,570	.41	n.a.	n.a.
Production clerk and/or coordinator	6,520	1.05	9	8
Shipping packer	4,130	.66	8	7
Shipping and/or receiving clerk	4,620	.74	8	11
Stock clerk, stockroom, warehouse or storage yard	7,620	1.23	11	9
All other plant clerical workers	2,910	.47	n.a.	n.a.
SALES OCCUPATIONS	13,780	2.22	n.a.	n.a.
Sales representative, sales agent, and/or sales associate	13,500	2.18	11	13
All other sales workers	280	.04	n.a.	n.a.

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Miscellaneous Manufacturing Industries

This industry group includes establishments manufacturing products not classified in other manufacturing industries. Examples of these industries are: Jewelry, silverware, and plated ware; musical instruments; toys and sporting and athletic goods; pen, pencils, and other office and artists' materials; buttons, costume novelties, and miscellaneous notions; brushes and brooms; caskets; and other assorted manufacturing industries.

In 1977, the industries employed 439,200 workers or 2 percent of all workers employed in manufacturing.

From 1971 to 1977, employment in the industries increased 6 percent.

The most populous occupations in the miscellaneous manufacturing industries, as shown in table 24, were: Assemblers, with 65,700 workers or 15 percent of total industry employment; production packagers (hand or machine), 16,600; sales agents-representatives-associates, 12,300; and bench hands, jewelry, 12,000.

The occupational distribution of employment is shown in chart 21.

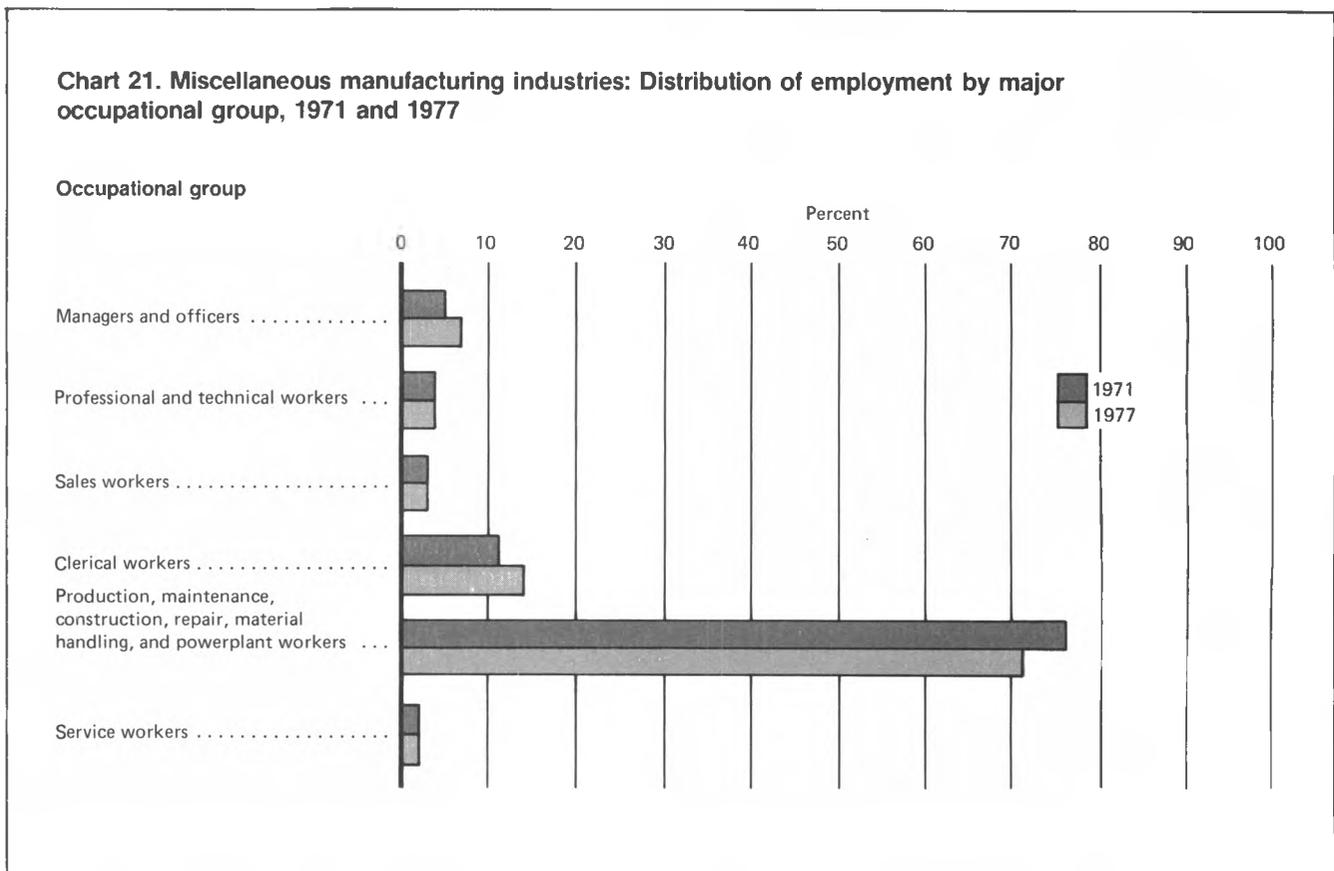


Table 24. Miscellaneous manufacturing industries: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ May 1977

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
TOTAL	439,230	100.00	-	100
MANAGERS AND OFFICERS	29,810	6.78	2	82
PROFESSIONAL OCCUPATIONS	13,180	2.95	n.a.	n.a.
Industrial engineer	1,160	.26	5	7
Mechanical engineer	980	.22	8	5
All other engineers	910	.20	n.a.	n.a.
Physical scientists	280	.06	n.a.	n.a.
Systems analyst, electronic data processing	360	.08	9	2
Purchasing agent and/or buyer	2,310	.52	3	19
Accountant and/or auditor	2,190	.49	4	14
Personnel and labor relations specialists	640	.14	5	6
Designer	3,320	.75	4	16
All other professional workers	1,030	.23	n.a.	n.a.
TECHNICAL OCCUPATIONS	4,400	.97	n.a.	n.a.
Computer programmer	580	.13	7	4
Drafter	1,200	.27	6	7
Electrical and/or electronic technician	920	.20	11	3
All other engineering technicians	960	.21	n.a.	n.a.
Science technicians	400	.09	14	1
All other technicians	340	.07	n.a.	n.a.
SERVICE OCCUPATIONS	6,670	1.49	n.a.	n.a.
Janitor, porter, and/or cleaner	4,100	.93	3	23
Guard and/or doorkeeper	900	.20	7	3
Food service workers	250	.05	n.a.	n.a.
Supervisor, nonworking--service only	630	.14	12	3
All other service workers	790	.17	n.a.	n.a.
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS	311,950	70.56	n.a.	n.a.
Mechanic, maintenance	2,350	.53	9	6
All other mechanics and repairers	1,120	.25	n.a.	n.a.
Truck driver	1,890	.43	7	11
Cabinetmaker	2,190	.49	10	4
Carpenter	1,740	.39	10	5
Compositor and/or typesetter	870	.19	8	4
Crane, derrick, and/or hoist operator	680	.15	11	3
Delivery and/or route worker	740	.16	10	4
Electrician	1,990	.45	8	7
Filer, grinder, buffer, chipper, cleaner, and/or polisher	4,270	.97	6	8
Supervisor, nonworking	9,900	2.25	2	28
Industrial truck operator	2,360	.53	7	5
Inspector	6,560	1.49	5	12
Jeweler and/or silversmith	4,600	1.04	6	8
Machinist	2,040	.46	7	6
Maintenance repairer, general utility	2,700	.61	4	13
Helper, trades	1,180	.26	12	4
Millwright	400	.09	13	1
Order filler	4,140	.94	6	11
Painter, maintenance	500	.11	14	2
Electroplater	1,320	.30	8	5
Press operator and/or plate printer	1,650	.37	13	3
Production packager, hand or machine	16,630	3.78	5	17
Sewing machine operator, regular equipment--garment	2,850	.64	14	2
Sewing machine operator, special equipment and/or automatic equipment--garment	720	.16	28	1
Sewing-machine operator, regular equipment- nongarment	6,580	1.49	8	7
Sewing-machine operator, special equipment and/or automatic equipment-nongarment	1,580	.35	18	2
Sheet metal worker	2,740	.62	8	7
Tool and die maker	3,370	.76	6	9
Welder and/or flamecutter	3,540	.80	7	9
Bench hand, jewelry	12,010	2.73	6	12

See footnotes at end of table.

Table 24. Miscellaneous manufacturing industries: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ May 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
PRODUCTION, MAINTENANCE, CONSTRUCTION, REPAIR, MATERIAL HANDLING AND POWERPLANT OCCUPATIONS—Continued				
Boring-machine operator, wood	340	0.07	20	1
Caster	1,170	.26	7	6
Caster, finished or semi-finished products	280	.06	14	1
Chain maker, hand	620	.14	29	1
Cut-off-saw operator, lumber	610	.13	9	3
Drill-press and/or boring-machine operator	1,530	.34	11	4
Etcher and/or engraver	1,730	.39	9	5
Fabricator, plastics	1,840	.41	14	4
Finisher, hand	2,100	.47	13	3
Gem cutter	530	.12	19	2
Grinding and/or abrading machine operator, metal	6,250	1.42	6	9
Lathe operator, wood	340	.07	22	1
Lathe and/or turning machine operator, metal	810	.18	12	3
Machine setter, woodworking	340	.07	11	2
Machine tool operator, combination	1,110	.25	11	3
Machine tool operator, numerical-control	770	.17	20	2
Machine tool operator, toolroom	590	.13	13	2
Machine tool setter, metalworking	1,100	.25	13	3
Metal mold maker	340	.07	15	1
Milling and/or planing machine operator	280	.06	16	1
Wood machinist	1,170	.26	11	3
Plater helper	1,500	.34	9	4
Ripsaw operator	430	.09	10	2
Rubber mold maker	610	.13	21	3
Sander, wood	1,760	.40	10	3
Spinner	310	.07	14	1
Stone setter	2,820	.64	7	7
Tester	650	.14	12	2
Trimmer, plastics	620	.14	14	2
Tumbler operator, plastics	300	.06	14	1
Vulcanizer, rubber plate	690	.15	12	3
Wax pattern worker	2,380	.54	9	4
Woodworking-machine operator	1,650	.37	9	3
Painter, production	4,870	1.10	4	16
Die-casting machine operator, metal and/or die-casting setter	850	.19	17	1
Riveter, light	1,150	.26	11	2
Punch-press operator, metal	5,900	1.34	6	11
Punch-press setter, metal	860	.19	9	4
Compression and/or injection-molding-machine operator, plastics	6,320	1.43	10	4
Conveyor operator or tender	290	.06	18	1
Dip plater, non-electrolytic	500	.11	15	2
Setter, plastic molding machine	860	.19	12	3
Casket coverer and/or casket liner	1,400	.31	11	3
Gluer and/or cementer, hand	3,050	.69	7	6
Screen or stencil printer and/or setter	2,240	.50	8	7
Screen cutter and/or maker, non-photographic	530	.12	12	2
Screen maker, photographic process	630	.14	12	3
Assembler, class A	2,200	.50	13	2
Assembler, class B	9,810	2.23	8	7
Assembler, class C	53,680	12.21	4	22
Decorator, hand	2,000	.45	10	4
Blow-molding machine operator	420	.09	23	0
Caster, plastics	590	.13	17	1
Laminator, preforms	840	.19	16	1
Press operator, plastics	1,310	.29	26	1
Tube molder, fiberglass	710	.16	41	0
Vacuum plastic forming machine operator	890	.20	14	2
All other skilled craft and kindred workers	8,250	1.87	n.a.	n.a.
All other operatives and semiskilled workers	26,280	5.98	n.a.	n.a.
All other laborers and unskilled workers	32,740	7.45	n.a.	n.a.
CLERICAL OCCUPATIONS				
Bookkeeping and/or billing machine operator	59,800	13.52	n.a.	n.a.
Computer operator	1,070	.24	5	8
Computer operator	890	.20	5	6
Keypunch operator	1,280	.29	5	5

See footnotes at end of table.

Table 24. Miscellaneous manufacturing industries: Employment, relative standard error, and percent of establishments reporting selected occupations,¹ May 1977—Continued

Occupation	Employment	Percent of total employment	Relative error(in percentage) ²	Percent of establishments reporting the occupation
CLERICAL OCCUPATIONS—Continued				
All other office machine operators	530	0.12	n.a.	n.a.
Stenographer	570	.12	7	4
Accounting clerk	3,570	.81	3	19
Bookkeeper, hand	3,120	.71	3	26
File clerk	940	.21	5	6
General clerk, office	7,800	1.77	5	32
Order clerk	2,600	.59	5	11
Payroll and/or timekeeping clerk	1,740	.39	4	13
Personnel clerk	580	.13	5	6
Procurement clerk	760	.17	6	6
Receptionist	580	.13	6	6
Secretary	6,200	1.41	3	31
Statistical clerk	450	.10	9	3
Switchboard operator	280	.06	8	2
Switchboard operator-receptionist	1,240	.28	3	13
Typist	2,430	.55	5	12
Clerical supervisor, office or plant	2,310	.52	5	11
All other office clerical workers	1,470	.33	n.a.	n.a.
Production clerk and/or coordinator	2,770	.63	4	14
Shipping packer	8,140	1.85	3	28
Shipping and/or receiving clerk	4,290	.97	3	24
Stock clerk, stockroom, warehouse or storage yard	3,180	.72	5	13
All other plant clerical workers	1,010	.22	n.a.	n.a.
SALES OCCUPATIONS	13,420	3.04	17	35
Sales representative, sales agent, and/or sales associate	12,290	2.79	8	31
Sales clerk	1,130	.25	9	5

¹ Estimates of fewer than 50 are generally not shown separately since such estimates are considered unreliable.

² The relative standard errors apply equally to data on estimated employment and percent of total employment; relative standard errors

estimated at the level of 2 chances out of 3. For further information on sampling variability and other types of errors, consult the section on "method".

n.a. Not available.

Appendix A. Survey Methods and Reliability of Estimates

Scope of survey

The survey covered private manufacturing establishments in Standard Industrial Classification (SIC) codes 20 to 39. Geographically, the survey covered all 50 States plus the District of Columbia.

Method of collection

Survey schedules were mailed to most sample establishments; personal visits were made to some larger companies.

Two additional mailings were sent to nonrespondents at approximately 6-week intervals. Nonrespondents considered critical to the survey (due to size) were called on the telephone and in some cases visited.

Sampling procedure

The sampling frame for this survey was the list of units in the specified SIC's as reported to the State employment security agency. Because each cooperating State selected its own sample, reference dates of the sampling frame varied according to the last updates to the frame and the time sampling took place. The reference date for the frame used for sampling in the 10 supplemental States was the first quarter of 1976. The reference week of the survey, depending on the SIC of the sampled unit, was the week that included April 12, May 12, or June 12, 1977, as shown in table A-1.

The universe was stratified into SIC and size classes. The size classes were determined by employment as follows:

<i>Size class</i>	<i>Employees</i>
1	0-3
2	4-9
3	10-19
4	20-49
5	50-99
6	100-249
7	250-499
8	500-999
9	1,000 and over

Reporting units with 0-3 employees were not sampled in all States, but units with 4-9 employees were given

Table A-1. Reference dates of survey

SIC	Reference date	SIC	Reference date
20	June 12	30	June 12
21	April 12	31	May 12
22	April 12	32	May 12
23	May 12	33	April 12
24	May 12	34	June 12
25	June 12	35	June 12
26	April 12	36	June 12
27	May 12	37	June 12
28	June 12	38	June 12
29	June 12	39	May 12

larger weights to represent the employment in the smaller size class. Reporting units with 250 or more employees were included in the sample with certainty. A sample size intended to produce State estimates with a target relative error of 7.5 percent at one standard deviation was developed for the noncertainty size classes. This was done for groups of SIC's based on averages of occupational rates and coefficients of variation (CV's) from the previous survey for a set of typical occupations. This SIC sample size was allocated to the size classes proportional to size class employment. The sample was selected systematically with equal probability within each State/SIC/size class cell.

The sample size for the 10 supplemental States was developed by first determining the sample size required for national estimates in each 2-digit SIC with a target relative error of 7.5 percent at one standard deviation. This was done by averaging CV's and occupational rates for a set of scientific, technical, and engineering occupations from the previous survey. Establishments with 1,000 or more employees were included with certainty. This national SIC sample size was then allocated to the noncooperating State/size class cells proportional to employment.

The above allocations resulted in a total initial sample size for all States of 169,429 reporting units.

Response

There were 148,136 final eligible units in the sample (i.e. excluding establishments that were out of business, out of scope, etc.). Usable responses were obtained from 83,814 units, producing a response rate of 56.7 percent based on units and 55.4 percent based on employment.

Subsequent to preparation of the national estimates, additional data were received by States and used in preparing State estimates. Response rates in most States were significantly higher than the response rate used to develop national estimates.

Estimation

A weight was determined for each sample unit from which a usable response was received. Each weight was composed of two factors. The first factor is the inverse of the probability of selection. For questionnaires that were not returned or otherwise not usable, a nonresponse adjustment was made to correct for these nonrespondents. For each of the 3-digit State/SIC/size class sampling cells, a nonresponse factor was calculated that was equal to:

Weighted sample employment of all eligible units in sample

Weighted sample employment of all responding eligible units

Sample employment was taken from the sampling frame. If the factor in a cell was greater than a predetermined maximum factor, which increased as the number of respondents in a cell increased, the cell was collapsed with other homogeneous cells within the SIC until the factor for the combined cells was not greater than the appropriate maximum factor. If the collapsing procedure terminated (i.e. no more cells were available for collapse) before satisfying the above constraint, then the appropriate maximum factor was used. For size classes 1-6, homogeneous cells were determined to be other *size* cells within the SIC and State. For size classes 7-9, homogeneous cells were determined to be other *State* cells within the SIC and size. The weight for each establishment was the product of the two factors.

A combined ratio estimate of occupational employment was used to develop the national estimates. The auxiliary variable used was total employment. The estimating formula is:

$$\hat{p} = \sum_i \left[\frac{\sum_j \sum_k w_{ijk} P_{ijk}}{\sum_j \sum_k w_{ijk} e_{ijk}} \cdot M_i \right]$$

Where: \hat{p} = 2-digit industry occupational employment estimate
i = 3-digit industry within a 2-digit industry
j = size class
k = establishment
 w_{ijk} = weight after nonresponse adjustment
 P_{ijk} = occupational employment in *i*-th industry, *j*-th size class and *k*-th establishment
 e_{ijk} = total employment in *i*-th industry, *j*-th size class and *k*-th establishment
 M_i = benchmark total employment in *i*-th industry

The population value of total employment (M_i) was obtained from the BLS monthly survey of employment, hours, and earnings in nonagricultural establishments.

The standard form for the sampling variance for a combined ratio estimate is:

$$V(\hat{p}) = \sum_i \sum_j \frac{N_{ij}^2 (1-f_{ij})}{n_{ij}} \cdot A_{ij}$$

$$A_{ij} = S_{p_{ij}}^2 + R_i^2 S_{e_{ij}}^2 - 2\rho_{ij} S_{p_{ij}} S_{e_{ij}}$$

Where: $V(\hat{p})$ = variance of \hat{p}
i = 3-digit industry within a 2-digit industry
j = size class
 N_{ij} = total number of units in the *i*-th industry and *j*-th size class
 f_{ij} = sampling fraction in the *i*-th industry and *j*-th size class
n_{ij} = number of sample units in the *i*-th industry and *j*-th size class
 $S_{p_{ij}}$ = standard deviation of p within the *i*-th industry and *j*-th size class
 $S_{e_{ij}}$ = standard deviation of e within the *i*-th industry and *j*-th size class
 ρ_{ij} = correlation coefficient between p and e within the *i*-th industry and *j*-th size class.

The variances for the occupational estimates were estimated using the following formula:

$$\text{Var}(\hat{P}) = \sum_i \sum_j T_{ij} V_{ij}^2$$

$$T_{ij} = [B_{ij}] \cdot [D_{ij}] \cdot [F_{ij}]^2$$

$$B_{ij} = (M_{ij} - e_{ij}) / (M_{ij})$$

$$D_{ij} = (G_{ij}) / (H_{ij})$$

$$G_{ij} = \left(\sum_k w_{ijk}^2 \right) \left(\sum_k w_{ijk} \right)$$

$$H_{ij} = \left(\sum_k w_{ijk} \right)^2 - \left(\sum_k w_{ijk}^2 \right)$$

$$F_{ij} = (M_i) / \left(\sum_j \sum_k w_{ijk} e_{ijk} \right)$$

$$V_{ij}^2 = \sum_k w_{ijk} \cdot L_{ijk}^2$$

$$L_{ijk} = (P_{ijk} - R_i e_{ijk}) - (\bar{P}_{ij} R_i \bar{e}_{ij})$$

Where:

M_{ij} = benchmark total employment in the *i*-th industry and *j*-th size class

$$R_i = \left(\sum_j \sum_k w_{ijk} P_{ijk} \right) / \left(\sum_j \sum_k w_{ijk} e_{ijk} \right)$$

$$e_{ij} = \sum_k e_{ijk}$$

All other terms are as defined earlier. This formula is almost a computational form of the earlier standard formula. One simplifying assumption has been made, as follows:

$$W_{ijk} = c_{ij} \text{ for all } k \text{ in a given } ij \text{ cell}$$

That is, the weights are equal to a constant c within a given 3-digit industry/size cell.

At this time, the total effect of this assumption on the variance estimates has not been measured.

Reliability of estimates

Estimates from the sample may differ from results of a complete survey of all establishments in the sampled

lists. Two types of errors, sampling and nonsampling, are possible in an estimate based on a sample survey. Sampling error occurs because observations are made only on a sample, not on the entire population. Nonsampling error can be attributed to many sources, e.g., inability to obtain information about all cases in the sample; differences in the respondents' interpretation of questions; inability of respondents to provide correct information; errors made in recording, coding, or processing; errors made in estimating values for missing data; and failure to represent all units in the population.

Standard errors of estimates provide guides to the potential size of sampling errors. Estimates of the standard errors, computed from the sample data, are presented in the form of variance and relative errors. The variance is the standard error squared and the relative error is the standard error divided by the estimated value to which it refers.

The sample estimate and its standard error enable one to construct confidence intervals or ranges that would include the complete coverage survey value for specified percentages of all the possible samples that could be obtained from the sample design for this survey. The complete coverage value would be included in the range:

1. From one standard error below to one standard error above the derived estimate for 68 percent of all samples.
2. From 1.6 standard errors below to 1.6 standard errors above the derived estimate for 90 percent of all samples.

3. From two standard errors below to two standard errors above the derived estimate for 95 percent of all samples.
4. From three standard errors below to three standard errors above the derived estimate for nearly all samples.

An inference that the complete coverage value would be within the indicated ranges would be correct in approximately the relative frequencies shown.

For example, suppose an estimated total is shown as 5,000 with an associated relative error of 2 percent. Then the standard error is 100 (2 percent of 5,000) and there is a 68-percent chance that the complete coverage total would be between 4,900 and 5,100 and it is almost certain that the complete coverage total would be between 4,700 and 5,300.

Relative errors primarily indicate the magnitude of the sampling error, but do not measure biases in the data due to nonsampling error. Efforts were made to reduce the biases due to errors in recording, coding, and processing the data. The adjustment made for nonrespondents assumed that the characteristics of the nonrespondents were the same as those of the respondents. To the extent this is not true, bias is introduced in the data. The magnitude of these biases is not known.

Particular care should be exercised in interpreting small estimates, estimates based on a small number of cases, or small differences between estimates because the sampling errors are relatively large and the magnitude of the biases is unknown.

Appendix B. OES Survey Data Available from State Agencies

State data on occupational employment in manufacturing are available as indicated in the following table. These reports may be obtained from the State employ-

ment security agencies listed on the inside back cover of this publication.

Table B-1. OES survey data available by State and year

State	1971	1974	1977	State	1971	1974	1977
Alabama.....		x	x	Mississippi.....		x	x
Alaska.....	x	x	x	Missouri.....	x	x	x
Arizona.....			x	Nevada.....	x	x	x
Arkansas.....			x	New Hampshire.....			x
California.....			x	New Jersey.....	x	x	x
Colorado.....	x	x	x	New Mexico.....			x
Connecticut.....			x	New York.....		x	x
Delaware.....		x	x	North Carolina.....		x	x
District of Columbia.....		x	x	North Dakota.....			x
Florida.....	x	x	x	Oklahoma.....	x	x	x
Georgia.....		x	x	Oregon.....	x	x	x
Hawaii.....			(¹)	Pennsylvania.....		x	x
Idaho.....			x	Rhode Island.....			x
Illinois.....			(¹)	South Carolina.....	x	x	x
Indiana.....	x	x	x	Tennessee.....		x	x
Kentucky.....		x	x	Texas.....		x	x
Louisiana.....			x	Utah.....	x	x	x
Maine.....		x	x	Virginia.....	x	x	x
Maryland.....		x	x	West Virginia.....	x	x	x
Massachusetts.....	x	x	x	Wisconsin.....	x	x	x
Michigan.....			x	Wyoming.....			x
Minnesota.....	x	x	x				

(¹) Report in progress.

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State Agencies Cooperating in the OES Program

BLS Region	
IV ALABAMA	-Department of Industrial Relations, Industrial Relations Building, Montgomery 36130
X ALASKA	-Employment Security Division, Department of Labor, P.O. Box 1149, Juneau 99802
IX ARIZONA	-Department of Economic Security, P.O. Box 6123, Phoenix 85005
VI ARKANSAS	-Employment Security Division, Department of Labor, P.O. Box 2981, Little Rock 72203
IX CALIFORNIA	-Employment Development Department, P.O. Box 1679, Sacramento 95808
VIII COLORADO	-Management Services, Department of Labor and Employment, 1210 Sherman Street, Denver 80203
I CONNECTICUT	-Employment Security Division, Labor Department, 200 Folly Brook Boulevard, Wethersfield 06109
III DELAWARE	-Department of Labor, University Plaza Office Complex, Bldg. D, Chapman Rd., Route 273, Newark 19713
III DIST. OF COL.	-Office of Administration and Management Service, D.C. Department of Manpower, Suite 1000, 605 G Street, N.W., Washington 20001
IV FLORIDA	-Department of Commerce, Division of Employment Security, Office of Research and Statistics, Caldwell Building, Tallahassee 32304
IV GEORGIA	-Department of Labor, 254 Washington Street, S.W., Atlanta 30334
IX HAWAII	-Department of Labor and Industrial Relations, P.O. Box 3680, Honolulu 96811
X IDAHO	-Department of Employment, P.O. Box 35, Boise 83707
V ILLINOIS	-Bureau of Employment Security, Department of Labor, 910 South Michigan Avenue, Chicago 60605
V INDIANA	-Employment Security Division, 10 North Senate Avenue, Indianapolis 46204
IV KENTUCKY	-Department of Human Resources, 275 E. Main Street, 2nd Floor West, Frankfort 40601
VI LOUISIANA	-Department of Labor, P.O. Box 44094—Capitol Station, Baton Rouge 70804
I MAINE	-Employment Security Commission, Department of Manpower Affairs, 20 Union Street, Augusta 04330
III MARYLAND	-Department of Human Resources, 1100 North Eutaw Street, Baltimore 21201
I MASSACHUSETTS	-Division of Employment Security, Charles F. Hurley Building, Government Center, Boston 02114
V MICHIGAN	-Employment Security Commission, Department of Labor, 7310 Woodward Avenue, Detroit 48202
V MINNESOTA	-Department of Economic Security, 390 North Robert Street, St. Paul 55101
IV MISSISSIPPI	-Employment Security Commission, P.O. Box 1699, Jackson 39205
VII MISSOURI	-Division of Employment Security, Department of Labor and Industrial Relations, P.O. Box 59, Jefferson City 65101
IX NEVADA	-Employment Security Department, P.O. Box 602, Carson City 89713
I NEW HAMPSHIRE	-Department of Employment Security, 32 South Main Street, Concord 03301
II NEW JERSEY	-Department of Labor and Industry, Division of Planning and Research, OES Survey, P.O. Box 359, Trenton 08625
VI NEW MEXICO	-Employment Service Division, Department of Human Services, P.O. Box 1928, Albuquerque 87103
II NEW YORK	-Division of Research and Statistics, N.Y. State Department of Labor, State Campus—Building 12, Albany 12201
IV NORTH CAROLINA	-Employment Security Commission, P.O. Box 25903, Raleigh 27611
VIII NORTH DAKOTA	-Employment Security Bureau, P.O. Box 1537, Bismarck 58505
VI OKLAHOMA	-Employment Security Commission, Research and Planning, Room 310, Will Rogers Memorial Office Building, Oklahoma City 73105
X OREGON	-Employment Division, Department of Human Resources, 875 Union Street, N.E., Salem 97130
III PENNSYLVANIA	-Department of Labor and Industry, Seventh and Forster Streets, Harrisburg 17121
I RHODE ISLAND	-Department of Employment Security, 24 Mason Street, Providence 02903
IV SOUTH CAROLINA	-Employment Security Commission, P.O. Box 995, Columbia 29202
IV TENNESSEE	-Department of Employment Security, Room 519, Cordell Hull Office Building, Nashville 37219
VI TEXAS	-Employment Commission, TEC Building, 15th and Congress Avenue, Austin 78778
VIII UTAH	-Department of Employment Security, P.O. Box 11249, Salt Lake City 84147
III VIRGINIA	-Manpower Research Division, Virginia Employment Commission, P.O. Box 1358, Richmond 23211
III WEST VIRGINIA	-Department of Employment Security, State Office Building, 112 California Avenue, Charleston 25305
V WISCONSIN	-Department of Industry, Labor, and Human Relations, P.O. Box 7944, Madison 53707
VIII WYOMING	-Employment Security Commission, P.O. Box 2760, Casper 82601