

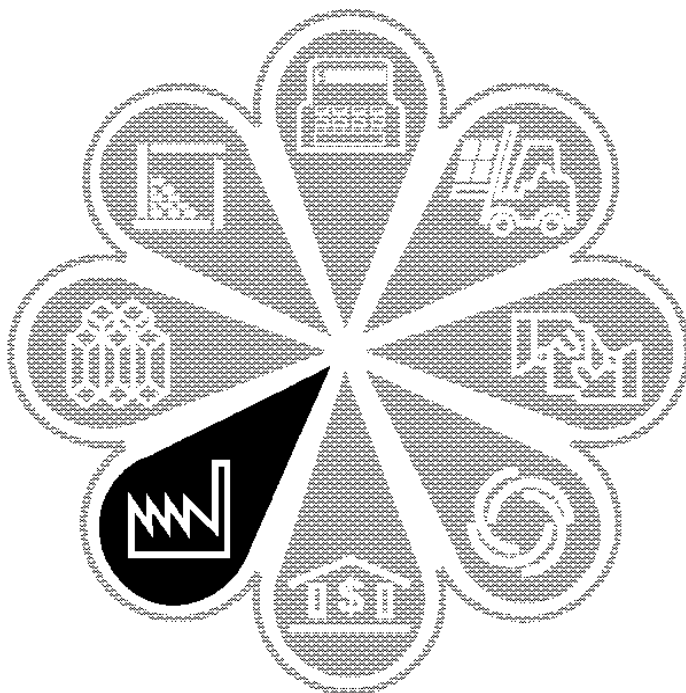
1992 Census of Manufactures

MC92-I-28A

INDUSTRY SERIES

Industrial Inorganic Chemicals

Industries 2812, 2813, 2816, and 2819



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U.S. Department of Commerce

Ronald H. Brown, Secretary

David J. Barram, Deputy Secretary

Economics and Statistics Administration

**Everett M. Ehrlich, Under Secretary
for Economic Affairs**

BUREAU OF THE CENSUS

Martha Farnsworth Riche, Director

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Manufacturing and Construction Division prepared this report. **David W. Cartwright**, Assistant Chief for Census and Related Programs, was responsible for the overall planning, management, and coordination of the census of manufactures. Planning and implementation were under the direction of **Michael Zampogna**, Chief, Wood and Chemical Products Branch, assisted by **Ted McGrath**, Section Chief, with primary staff assistance by **Lissene Hafenrichter**.

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If you have any questions concerning the statistics in this report, call 301-457-4810.



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Introduction to the Economic Census

PURPOSES AND USES OF THE ECONOMIC CENSUS

The economic census is the major source of facts about the structure and functioning of the Nation's economy. It provides essential information for government, business, industry, and the general public.

The economic census furnishes an important part of the framework for such composite measures as the gross domestic product, input/output measures, production and price indexes, and other statistical series that measure short-term changes in economic conditions.

Policymaking agencies of the Federal Government use the data, especially in monitoring economic activity and providing assistance to business.

State and local governments use the data to assess business activities and tax bases within their jurisdictions and to develop programs to attract business.

Trade associations study trends in their own and competing industries and keep their members informed of market changes.

Individual businesses use the data to locate potential markets and to analyze their own production and sales performance relative to industry or area averages.

AUTHORITY AND SCOPE

Title 13 of the United States Code (sections 131, 191, and 224) directs the Census Bureau to take the economic census every 5 years, covering years ending in 2 and 7. The 1992 Economic Census consists of the following eight censuses:

- Census of Retail Trade
- Census of Wholesale Trade
- Census of Service Industries
- Census of Financial, Insurance, and Real Estate Industries
- Census of Transportation, Communications, and Utilities
- Census of Manufactures
- Census of Mineral Industries
- Census of Construction Industries

Special programs also cover enterprise statistics and minority-owned and women-owned businesses. (The 1992 Census of Agriculture and 1992 Census of Governments are conducted separately.) The next economic census is scheduled to be taken in 1998 covering the year 1997.

AVAILABILITY OF THE DATA

The results of the economic census are available in printed reports for sale by the U.S. Government Printing Office and on compact discs for sale by the Census Bureau. Order forms for all types of products are available on request from Customer Services, Bureau of the Census, Washington, DC 20233-8300. A more complete description of publications being issued from this census is on the inside back cover of this document.

Census facts are also widely disseminated by trade associations, business journals, and newspapers. Volumes containing census statistics are available in most major public and college libraries. Finally, State data centers in every State as well as business and industry data centers in many States also supply economic census statistics.

WHAT'S NEW IN 1992

The 1992 Economic Census covers more of the economy than any previous census. New for 1992 are data on communications, utilities, financial, insurance, and real estate, as well as coverage of more transportation industries. The economic, agriculture, and governments censuses now collectively cover nearly 98 percent of all economic activity.

Among other changes, new 1992 definitions affect the boundaries of about a third of all metropolitan areas. Also, the Survey of Women-Owned Businesses has now been expanded to include all corporations.

HISTORICAL INFORMATION

The economic census has been taken as an integrated program at 5-year intervals since 1967 and before that for 1963, 1958, and 1954. Prior to that time, the individual subcomponents of the economic census were taken separately at varying intervals.

The economic census traces its beginnings to the 1810 Decennial Census, when questions on manufacturing were included with those for population. Coverage of economic activities was expanded for 1840 and subsequent censuses to include mining and some commercial activities. In 1902, Congress established a permanent Census Bureau and directed that a census of manufactures be taken every 5 years. The 1905 Manufactures Census was the first time a census was taken apart from the regular every-10-year population census.

The first census of business was taken in 1930, covering 1929. Initially it covered retail and wholesale trade and construction industries, but it was broadened in 1933 to include some of the service trades.

The 1954 Economic Census was the first census to be fully integrated—providing comparable census data across economic sectors, using consistent time periods, concepts, definitions, classifications, and reporting units. It was the first census to be taken by mail, using lists of firms provided by the administrative records of other Federal agencies. Since 1963, administrative records also have been used to provide basic statistics for very small firms, reducing or eliminating the need to send them census questionnaires. The Enterprise Statistics Program, which publishes combined data from the economic census, was made possible with the implementation of the integrated census program in 1954.

The range of industries covered in the economic censuses has continued to expand. The census of construction industries began on a regular basis in 1967, and the scope of service industries was broadened in 1967, 1977, and 1987. The census of transportation began in 1963 as a set of surveys covering travel, transportation of commodities, and trucks, but expanded in 1987 to cover business establishments in several transportation industries. For 1992, these statistics are incorporated into a broadened census of transportation, communications, and utilities. Also new for 1992 is the census of financial, insurance, and real estate industries. This is part of a gradual expansion in coverage of industries previously subjected to government regulation.

The Survey of Minority-Owned Business Enterprises was first conducted as a special project in 1969 and was incorporated into the economic census in 1972 along with the Survey of Women-Owned Businesses.

An economic census has also been taken in Puerto Rico since 1909, in the Virgin Islands of the United States and Guam since 1958, and in the Commonwealth of the Northern Mariana Islands since 1982.

Statistical reports from the 1987 and earlier censuses provide historical figures for the study of long-term time series and are available in some large libraries. All of the census data published since 1967 are still available for sale on microfiche from the Census Bureau.

AVAILABILITY OF MORE FREQUENT ECONOMIC DATA

While the census provides complete enumerations every 5 years, there are many needs for more frequent data as well. The Census Bureau conducts a number of monthly, quarterly, and annual surveys, with the results appearing in publication series such as Current Business Reports (retail and wholesale trade and service industries), the Annual Survey of Manufactures, Current Industrial Reports, and the Quarterly Financial Report. Most of these surveys, while providing more frequent observations, yield less kind-of-business and geographic detail than the census. The County Business Patterns program offers annual statistics on the number of establishments, employment, and payroll classified by industry within each county.

SOURCES FOR MORE INFORMATION

More information about the scope, coverage, classification system, data items, and publications for each of the economic censuses and related surveys is published in the *Guide to the 1992 Economic Census and Related Statistics*. More information on the methodology, procedures, and history of the census will be published in the *History of the 1992 Economic Census*. Contact Customer Services for information on availability.

Census of Manufactures

GENERAL

This report, from the 1992 Census of Manufactures, is one of a series of 83 industry reports, each of which provides statistics for individual industries or groups of related industries. Additional separate reports will be issued for each State and the District of Columbia and for special subjects such as manufacturers' shipments to the federal government and concentration ratios in manufacturing.

The industry reports include such statistics as number of establishments, employment, payroll, value added by manufacture, cost of materials consumed, capital expenditures, product shipments, etc.

State reports present similar statistics for each State and its important metropolitan areas (MA's), counties, and places. Selected statistical totals for "all manufacturing" have been shown in the State reports for MA's with 250 employees or more and for counties and places with 500 employees or more.

The *General Summary* report contains industry, product class, and geographic area statistics summarized in one report. The introduction to the *General Summary* discusses, at greater length, many of the subjects described in this introduction. For example, the *General Summary* text discusses the relationship of value added by manufacture to national income by industry of origin, the changes in statistical concepts over the history of the censuses, and the valuation problems arising from intracompany transfers between manufacturing plants of a company and between manufacturing plants and sales offices and sales branches of a company.

SCOPE OF CENSUS AND DEFINITION OF MANUFACTURING

The 1992 Census of Manufactures covers all establishments with one paid employee or more primarily engaged in manufacturing as defined in the *1987 Standard Industrial Classification (SIC) Manual*¹. This is the system of industrial classification developed by experts on classification in Government and private industry under the guidance of the Office of Information and Regulatory Affairs, Office of

¹*Standard Industrial Classification Manual: 1987*. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Stock No. 041-001-00314-2.

Management and Budget. This classification system is used by Government agencies as well as many organizations outside the Government.

The SIC Manual defines manufacturing as the mechanical or chemical transformation of substances or materials into new products. The assembly of component parts of products also is considered to be manufacturing if the resulting product is neither a structure nor other fixed improvement. These activities are usually carried on in plants, factories, or mills that characteristically use power-driven machines and materials-handling equipment.

Manufacturing production is usually carried on for the wholesale market, for transfers to other plants of the same company, or to the order of industrial users rather than for direct sale to the household consumer. Some manufacturers in a few industries sell chiefly at retail to household consumers through the mail, through house-to-house routes, or through salespersons. Some activities of a service nature (enameling, engraving, etc.) are included in manufacturing when they are performed primarily for trade. They are considered nonmanufacturing when they are performed primarily to the order of the household consumer.

RELATIONSHIP BETWEEN ANNUAL SURVEY OF MANUFACTURES AND CENSUS OF MANUFACTURES

The Bureau of the Census conducts the annual survey of manufactures (ASM) in each of the 4 years between the censuses of manufactures. The ASM is a probability-based sample of approximately 62,000 establishments and collects the same industry statistics (employment, payroll, value of shipments, etc.) as the census of manufactures. In addition to collecting the information normally requested on the census form, the establishments in the ASM sample are requested to supply information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, costs of purchased services, and foreign content of materials consumed. Except for supplemental labor costs, the extra ASM items are collected only in census years.

ESTABLISHMENT BASIS OF REPORTING

The census of manufactures is conducted on an establishment basis. A company operating at more than one location is required to file a separate report for each

location. The ASM also is conducted on an establishment basis, but separate reports are filed for just those establishments selected in the sample. Companies engaged in distinctly different lines of activity at one location are requested to submit separate reports if the plant records permit such a separation and if the activities are substantial in size.

In 1992, as in earlier years, a minimum size limit was set for inclusion of establishments in the census. All establishments employing one person or more at any time during the census year are included. The same size limitation has applied since 1947 in censuses and annual surveys of manufactures. In the 1939 and earlier censuses, establishments with less than \$5,000 value of products were excluded. The change in the minimum size limit in 1947 does not appreciably affect the historical comparability of the census figures except for data on number of establishments for a few industries. This report excludes information for separately operated administrative offices, warehouses, garages, and other auxiliary units that service manufacturing establishments of the same company (see Auxiliaries).

MANUFACTURING UNIVERSE AND CENSUS REPORT FORMS

The 1992 Census of Manufactures universe includes approximately 380,000 establishments. The amounts of information requested from manufacturing establishments were dependent upon a number of factors. The more important considerations were the size of the company and whether it was included in the annual survey of manufactures. The methods of obtaining information for the various subsets of the universe to arrive at the aggregate figures shown in the publication are described below:

1. **Small single-establishment companies not sent a report form.** In the 1992 Census of Manufactures, approximately 143,000 small single-establishment companies were excused from filing reports. Selection of these small establishments was done on an industry-by-industry basis and was based on annual payroll and total shipments data as well as on the industry classification codes contained in the administrative records of Federal agencies. The cutoffs were selected so that these administrative-records cases would account for no more than 3 percent of the value of shipments for all manufacturing. Generally, all single-establishment companies with less than 5 employees were excused, while all establishments with more than 20 employees were mailed forms.

Information on the physical location of the establishment, as well as information on payrolls, receipts (shipments), and industry classification, was obtained from the administrative records of other Federal agencies under special arrangements, which safeguarded their confidentiality. Estimates of data for these small establishments were developed using industry averages in conjunction with the administrative information. The value of shipments and cost of materials

were not distributed among specific products and materials for these establishments but were included in the product and material "not specified by kind" (n.s.k.) categories.

The industry classification codes included in the administrative-records files were assigned on the basis of brief descriptions of the general activity of the establishment. As a result, an indeterminate number of establishments were erroneously coded at the four-digit SIC level. This was especially true whenever there was a relatively fine line of demarcation between industries or between manufacturing and nonmanufacturing activity.

Sometimes these administrative-records cases were only given a two- or three-digit SIC group. For the 1992 Census of Manufactures, these establishments were sent a separate classification form, which requested information on the products and services of the establishment. This form was used to code many of these establishments to the four-digit SIC level. Establishments that did not return the classification form were coded later to those four-digit SIC industries identified as "not elsewhere classified" (n.e.c.) within the given two- or three-digit industry groups.

As a result of these situations, a number of small establishments may have been misclassified by industry. However, such possible misclassification has no significant effect on the statistics other than on the number of companies and establishments.

The total establishment count for individual industries should be viewed as an approximation rather than a precise measurement. The counts for establishments with 20 employees or more are far more reliable than the count of total number of establishments.

2. **Establishments sent a report form.** The over 237,000 establishments covered in the mail canvass were divided into three groups:

- a. **ASM sample establishments.** This group consisted of approximately 62,000 establishments covering all the units of large manufacturing establishments as well as a sample of the medium and smaller establishments. The probability of selection was proportionate to size (see Appendix B, Annual Survey of Manufactures).

In a census of manufactures year, the ASM report form (MA-1000) replaces the first page of the regular census form for those establishments included in the ASM. In addition to information on employment, payroll, and other items normally requested on the regular census form, establishments in the ASM sample were requested to supply information on assets, capital expenditures, retirements, depreciation, rental payments, supplemental labor costs, and costs of purchased services. See appendix A, section 2, for an explanation of these items.

The census part of the report form is 1 of approximately 200 versions containing product, material, and special inquiries. The diversity of manufacturing activities necessitated the use of these many forms to canvass the 459 manufacturing industries. Each form was developed for a group of related industries.

Appearing on each form was a list of products primary to the group of related industries as well as secondary products and miscellaneous services that establishments classified in these industries were likely to be performing. Respondents were requested to identify the products, the value of each product, and, in a large number of cases, the quantity of the product shipped during the survey year. Space also was provided for the respondent to describe products not specifically identified on the form.

The report form also contained a materials-consumed inquiry, which varied from form to form depending on the industries being canvassed. The respondents were asked to review a list of materials generally used in their production processes. From this list, each establishment was requested to identify those materials consumed during the survey year, the cost of each, and, in certain cases, the quantity consumed. Once again, space was provided for the respondent to describe significant material not identified on the form.

Finally, a wide variety of special inquiries was included to measure activities peculiar to a given industry, such as operations performed and equipment used.

- b. **Large and medium establishments (non-ASM).** Approximately 112,000 establishments were included in this group. A variable cutoff, based on administrative-records payroll data and determined on an industry-by-industry basis, was used to select those establishments that were to receive 1 of the approximately 200 census of manufactures regular forms. The first page, requesting establishment data for items such as employment and payroll, was standard but did not contain the detailed statistics included on the ASM form. The product, material, and special inquiry sections supplied were based on the historical industry classification of the establishment.
- c. **Small single-establishment companies (non-ASM).** This group consisted of approximately 63,000 establishments. For those industries where application of the variable cutoff for administrative-records cases resulted in a large number of small establishments being included in the mail canvass, an abbreviated or "short" form was used. These establishments received 1 of the approximately 80 versions of the short form, which requested summary product and

material data and totals but no details on employment, payrolls, cost of materials, inventories, and capital expenditures.

Use of the short form has no adverse effect on published totals for the industry statistics; the same data were collected on the short form as on the long form. However, detailed information on materials consumed was not collected on the short form; thus its use would increase the value of the n.s.k. categories.

AUXILIARIES

In this industry report, the data on employment and payroll are limited to operating manufacturing establishments. The census report form filed for auxiliaries (ES-9200) requested a description of the activity of the establishments serviced. However, the manufacturing auxiliaries were coded only to the two-digit major group of the establishments they served; whereas, the operating establishments were coded to a four-digit manufacturing industry. Data for the approximately 11,000 separately operated auxiliaries are included in the geographic area series and in a report issued as part of the 1992 Enterprise Statistics Survey.

Auxiliaries are establishments whose employees are primarily engaged in performing supporting services for other establishments of the same company, rather than for the general public or for other business firms. They can be at different locations from the establishments served or at the same location as one of those establishments but not operating as an integral part thereof and serving two establishments or more. Where auxiliary operations are conducted at the same location as the manufacturing operation and operate as an integral part thereof, they usually are included in the report for the operating manufacturing establishment.

Included in the broad category of auxiliaries are administrative offices. Employees in administrative offices are concerned with the general management of multiestablishment companies, i.e., with the general supervision and control of two units or more, such as manufacturing plants, mines, sales branches, or stores. The functions of these employees may include the following:

1. Program planning, including sales research and coordination of purchasing, production, and distribution
2. Company purchasing, including general contracts and purchasing methods
3. Company financial policy and accounting
4. General engineering, including design of product machinery and equipment, and direction of engineering effort conducted at the individual operation locations
5. Company personnel matters
6. Legal and patent matters

Other types of auxiliaries serving the plants or central management of the company include purchasing offices, sales promotion offices, research and development organizations, etc.

INDUSTRY CLASSIFICATION OF ESTABLISHMENTS

Each of the establishments covered in the census was classified in 1 of 459 manufacturing industries in accordance with the industry definitions in the 1987 SIC Manual. The 1987 edition of this manual represents a major revision for manufacturing industries from the 1972 edition and its 1977 supplement. Appendix A of the 1987 Manual notes the revisions in the four-digit industry levels between 1972/77 and 1987.

An industry is generally defined as a group of establishments producing the same product or a closely related group of products. The product groupings from which industry classifications are derived are based on considerations such as similarity of manufacturing processes, types of materials used, types of customers, and the like. The resulting group of establishments must be significant in terms of number, value added by manufacture, value of shipments, and number of employees. The system operates in such a way that the definitions progressively become narrower with successive additions of numerical digits. For 1992, there are 20 major groups (two-digit SIC), 139 industry groups (three-digit SIC), and 459 industries (four-digit SIC). This represents an expansion of four-digit industries from 452 in 1972/77 and a reduction of three-digit groups from 143 in 1972/77. Product classes and products of the manufacturing industries have been assigned codes based on the industry from which they originate. There are about 11,000 products identified by a seven-digit code. The seven-digit products are considered the primary products of the industry with the same four digits.

Accordingly, an establishment is usually classified in a particular industry on the basis of its major activity during a particular year, i.e., production of the products primary to that industry exceeds, in value, production of the products primary to any other single industry. In a few instances, however, the industry classification of an establishment is not only determined by the products it makes but also by the process employed in operations. Refining of nonferrous metals from ore or rolling and drawing of nonferrous metals (processes which involve heavy capitalization in specialized equipment) would be classified according to the process used during a census year. These establishments then would be "frozen" in that industry during the following ASM years.

In either a census or ASM year, establishments included in the ASM sample with certainty weight, other than those involved with heavily capitalized activities described above, are reclassified by industry only if the change in the primary activity from the prior year is significant or if the change has occurred for 2 successive years. This procedure prevents reclassification when there are minor shifts in product mix.

In ASM years, establishments included in the ASM sample with noncertainty weight are not shifted from one industry classification to another. They are retained in the industry where they were classified in the base census year (see Appendix B, Annual Survey of Manufactures). However, in the following census year, these ASM plants are allowed to shift from one industry to another.

The results of these rules covering the switching of plants from one industry classification to another are that, at the aggregate level, some industries comprise different mixes of establishments between survey years and establishment data for such industry statistics as employment and payroll may be tabulated in different industries between survey years. Hence, comparisons between prior-year and current-year published totals, particularly at the four-digit SIC level, should be viewed with caution. This is particularly true for the comparison between the data shown for a census year versus the data shown for the previous ASM year.

As previously noted, the small establishments that may have been misclassified by industry are usually administrative-records cases whose industry codes were assigned on the basis of incomplete descriptions of the general activity of the establishment. Such possible misclassifications have no significant effect on the statistics other than on the number of companies and establishments.

While some establishments produce only the primary products of the industry in which they are classified, all establishments of an industry rarely specialize to this extent. The industry statistics (employment, inventories, value added by manufacture, total value of shipments including resales and miscellaneous receipts, etc.) shown in tables 1a through 5a, therefore, reflect not only the primary activities of the establishments in that industry but also their secondary activities. The product statistics in table 6a represent the output of all establishments whether or not they are classified in the same industry as the product. For this reason, in relating the industry statistics, especially the value of shipments to the product statistics, the composition of the industry's output shown in table 5b should be considered.

The extent to which industry and product statistics may be matched with each other is measured by two ratios which are computed from the figures shown in table 5b. The first of these ratios, called the primary product specialization ratio, measures the proportion of product shipments (both primary and secondary) of the establishments classified in the industry represented by the primary products of those establishments. The second ratio, called the coverage ratio, is the proportion of primary products shipped by the establishments classified in the industry to total shipments of such products by all manufacturing establishments.

However, establishments making products falling into the same industry category may use a variety of processes and materials to produce them. Also, the same industry classification (based on end products) may include both establishments that are highly integrated and those that

put only the finishing touches on an already highly fabricated item. For example, the refrigeration equipment industry includes instances of almost complete integration (production of the compressor, condensing unit, electric motor, casting, stamping of the case, and final assembly) all carried on at one plant. On the other hand, the condensing unit, the motor, and the case may be purchased and only assembled into the finished product.

In some instances, separate industry categories have been established for integrated and nonintegrated establishments. For other industries, the census provides separate statistics on the production of intermediate commodities made and used in the producing plant. For some industries characterized by many plants of the same company, separate figures on interplant transfers of products usually are shown.

Differences in the integration of production processes, types of operations, and alternatives in types of materials used should be considered when relating the industry statistics (employment, payrolls, value added, etc.) to the product and material data.

VALUE OF SHIPMENTS FOR THE INDUSTRY COMPARED WITH VALUE OF PRODUCT SHIPMENTS

This report shows value of shipments data for industries and products. In tables 1a through 5b, these data represent the total value of shipments of all establishments classified in a particular industry. The data include the shipments of the products classified in the industry (primary to the industry), products classified in other industries (secondary to the industry), and miscellaneous receipts (repair work, sale of scrap, research and development, installation receipts, and resales). Value of product shipments shown in table 6a represents the total value of all products shipped that are classified as primary to an industry.

CENSUS DISCLOSURE RULES

In accordance with Federal law governing census reports, no data are published that would disclose the data for an individual establishment or company. However, the number of establishments classified in a specific industry is not considered a disclosure, so this information may be released even though other information is withheld.

The disclosure analysis for the industry statistics in tables 1a through 5a of this report is based on the total value of shipments. When the total value of shipments cannot be shown without disclosing information for individual companies, the complete line is suppressed except for new capital expenditures. However, the suppressed data are included in higher-level totals. A separate disclosure analysis is performed for new capital expenditures that can be suppressed even though value of shipments data are publishable.

SPECIAL TABULATIONS

Special tabulations of data collected in the 1992 Census of Manufactures may be obtained on computer diskette or in tabular form. The data will be in summary form and subject to the same rules prohibiting disclosure of confidential information (including name, address, kind of business, or other data for individual business establishments or companies) as are the regular publications.

Special tabulations are prepared on a cost basis. A request for a cost estimate, as well as exact specifications on the type and format of the data to be provided, should be directed to the Chief, Manufacturing and Construction Division, Bureau of the Census, Washington, DC 20233.

ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used in this publication:

- Represents zero.
- (D) Withheld to avoid disclosing data for individual companies; data are included in higher level totals.
- (NA) Not available.
- (NC) Not comparable.
- (S) Withheld because estimate did not meet publication standards.
- (X) Not applicable.
- (Z) Less than half the unit shown.
- n.e.c. Not elsewhere classified.
- n.s.k. Not specified by kind.
- pt. Part.
- r Revised.
- SIC Standard Industrial Classification.

Other abbreviations, such as lb, gal, yd, doz, bbl, and s tons, are used in the customary sense.

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SIC's 357, 36-39	Bruce Goldhirsch	301-457-4817
Import/ export publications	Foreign Trade Division	301-457-3041
Industry analysis and forecasting	International Trade Administration	202-377-4356

Users' Guide for Locating Statistics in This Report by Table Number

For explanation of terms, see appendixes

Item	Four-digit industry statistics							Five-digit product class and seven-digit product statistics			
	Historical	Operating ratios	By geographic area	Summary and supplemental	By employment size	By industry and product class specialization	Materials consumed by kind	Industry-product analysis	Product shipments	Product class by geographic area	Historical product class
Number of companies	1a			3a					*6a		
Number of establishments	1a		2	3a	4	5a					
Employment and payroll:											
Number of employees	1a	1b	2	3a	4	5a					
Payroll	1a	1b	2	3a	4	5a					
Supplemental labor costs				3a							
Production workers	1a	1b	2	3a	4	5a					
Production-worker hours	1a	1b	2	3a	4	5a					
Production-worker wages	1a	1b	2	3a	4	5a					
Shipments, cost of materials, and value added:											
Value of shipments (four-digit)	1a	1b	2	3a	4	5a		5b			
Product class shipments (five-digit)									6a	6b	6c
Product shipments (seven-digit)									6a		
Value added by manufacture	1a	1b	2	3a	4	5a					
Cost of materials	1a	1b	2	3a	4	5a					
Fuels and electric energy				3a							
Materials consumed by kind							7				
Inventories:											
Total, end of year	1a			3a	4						
By stage of fabrication				3a							
Capital expenditures, assets, rental payments, and purchased services:											
New capital expenditures	1a		2	3b	4	5a					
Used plant and equipment expenditures				3b							
Gross assets				3b							
Depreciation				3b							
Retirements of buildings and machinery				3b							
Rental payments				3b							
Foreign content of materials consumed				3c							
Purchased services				3c							
Ratios:											
Specialization	1a							5b			
Coverage	1a							5b			

*Number of companies with shipments of more than \$100 thousand.

Contents

Industrial Inorganic Chemicals

[Page numbers listed here omit the prefix that appears as part of the number of each page]

	Page
Introduction to the Economic Census.....	III
Census of Manufactures	V
Users' Guide for Locating Statistics in This Report by Table Number	X
Description of Industries and Summary of Findings	3

TABLES

Industry Statistics

1a. Historical Statistics for the Industry: 1992 and Earlier Years.....	7
1b. Selected Operating Ratios for the Industry: 1992 and Earlier Years	8
2. Industry Statistics for Selected States: 1992 and 1987	9
3a. Summary Statistics for the Industry: 1992	10
3b. Gross Book Value of Depreciable Assets, Capital Expenditures, Retirements, Depreciation, and Rental Payments: 1992	11
3c. Supplemental Industry Statistics Based on Sample Estimates: 1992	12
4. Industry Statistics by Employment Size of Establishment: 1992	12
5a. Industry Statistics by Industry and Primary Product Class Specialization: 1992 ...	13

Product Statistics

5b. Industry-Product Analysis-Value of Industry and Primary Product Shipments; Specialization and Coverage Ratios: 1992 and Earlier Census Years	14
6a. Product and Product Classes-Quantity and Value of Shipments by All Producers: 1992 and 1987	15
6b. Product Classes-Value of Shipments by All Producers for Specified States: 1992 and 1987	17
6c. Historical Statistics for Product Classes-Value Shipped by All Producers: 1992 and Earlier Years	18

Material Statistics

7. Materials Consumed by Kind: 1992 and 1987	19
8. Statistics for Privately Owned and Operated Establishments: 1992 and 1987	20
9. Employees Engaged in Construction and Value of Work Done: 1992.....	20

APPENDIXES

A. Explanation of Terms	A-1
B. Annual Survey of Manufactures Sampling and Estimating Methodologies	B-1
C. Product Code Reference Tables	C-1

Publication Program..... Inside back cover

Description of Industries and Summary of Findings

This report shows 1992 Census of Manufactures statistics for establishments classified in each of the following industries:

SIC code and title

2812	Alkalies and Chlorine
2813	Industrial Gases
2816	Inorganic Pigments
2819	Industrial Inorganic Chemicals, N.E.C.

The industry statistics (employment, payroll, cost of materials, value of shipments, inventories, etc.) are reported for each establishment as a whole. Aggregates of such data for an industry reflect not only the primary activities of the establishments but also their activities in the manufacture of secondary products as well as their miscellaneous activities (contract work on materials owned by others, repair work, etc.). This fact should be taken into account in comparing industry statistics (tables 1 through 5a) with product statistics (table 6) showing shipments by all industries of the primary products of the specified industry. The extent of the "product mix" is indicated in table 5b, which shows the value of primary and secondary products shipped by establishments classified in the specified industry and the value of primary products of the industry shipped as secondary products by establishments classified in other industries.

Establishment data were tabulated based on industry definitions included in the *1987 Standard Industrial Classification (SIC) Manual*¹. The 1987 edition represents a major revision for manufacturing industries from the 1972 edition and its 1977 supplement. In addition to the 1987 SIC revision, changes were made to the product class (five-digit) and product code (seven-digit) categories. The product class and product code comparability between the 1992 and 1987 censuses is shown in appendix C. This appendix presents, in tabular form, the linkage from 1992 to 1987, and 1987 to 1992.

All dollar figures included in this report are at prices current for the year specified and, therefore, unadjusted for changes in price levels. Consequently, when making comparisons to prior years, users should take into consideration the inflation that has occurred.

¹*Standard Industrial Classification Manual: 1987*. For sale by Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Stock No. 041-001-00314-2.

INDUSTRY 2812, ALKALIES AND CHLORINE

This industry is made up of establishments primarily engaged in manufacturing alkalies and chlorine. Establishments primarily engaged in mining natural alkalies are classified in mining, industry 1474. Products of this industry also are collected in the Current Industrial Report (CIR) MA-28A, Inorganic Chemicals (annual and quarterly reports). For information regarding the CIR, see Contacts for Data Users at the end of the Census of Manufactures section.

The 1992 definition of this industry is the same as that used in the 1987 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1992 Census of Manufactures, Industry 2812, Alkalies and Chlorine, had employment of 8.0 thousand. The employment figure was 60 percent above the 5.0 thousand reported in 1987. Compared with 1991, employment increased 6 percent. The 1991 data are based on the Census Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

The leading States in employment in 1992 were Louisiana, New York, Texas, and West Virginia, accounting for approximately 63 percent of the industry's employment. This represents a shift from 1987 when West Virginia, Louisiana, Texas, and Alabama accounted for approximately 55 percent of the industry's employment.

The total value of shipments for establishments classified in this industry was \$2.8 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry in which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 2812 shipped \$2.1 billion of alkalies and chlorine considered primary to the industry, \$653.2 million of secondary products, and had \$28.3 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in this industry was 76 percent (specialization ratio). In 1987, the specialization ratio was 86 percent.

Establishments in this industry also accounted for 75 percent of products considered primary to the industry no matter where they were actually produced (coverage ratio). In 1987, the coverage ratio was 65 percent.

The products primary to industry 2812, no matter in what industry they were produced, appear in table 6a and

aggregate to \$2.8 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and energy used by establishments classified in the alkalies and chlorine industry amounted to \$1.4 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with less than 10 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for less than 1 percent of the total value of shipments.

INDUSTRY 2813, INDUSTRIAL GASES

This industry is made up of establishments primarily engaged in manufacturing industrial gases (including organic) for sale in compressed, liquid, and solid forms. Establishments primarily engaged in manufacturing fluorine and sulfur dioxide are classified in industry 2819; those manufacturing household ammonia are classified in industry 2842; those manufacturing other ammonia are classified in industry 2873; those manufacturing chlorine are classified in industry 2812; and those manufacturing fluorocarbon gases are classified in industry 2869. Distributors of industrial gases and establishments primarily engaged in shipping liquid oxygen are classified in wholesale trade, industry 5169. Products of this industry also are collected in the Current Industrial Reports (CIR) MA-28C and MQ-28C, Industrial Gases (annual and quarterly reports). For information regarding the CIR, see Contacts for Data Users at the end of the Census of Manufactures section.

The 1992 definition of this industry is the same as that used in the 1987 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1992 Census of Manufactures, Industry 2813, Industrial Gases, had employment of 7.7 thousand. The employment figure was 5 percent below the 8.1 thousand reported in 1987.

The leading States in employment in 1992 were California, Texas, and Ohio. These same States were the leaders in 1987.

The total value of shipments for establishments classified in this industry was \$3.1 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry in which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 2813 shipped \$2.9 billion of industrial gases considered primary to the industry, \$119.3 million of secondary products, and had \$50.4 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary

products to the total of both secondary and primary products shipped by establishments in this industry was 96 percent (specialization ratio). In 1987, the specialization ratio was 98 percent.

Establishments in this industry also accounted for 94 percent of products considered primary to the industry no matter where they were actually produced (coverage ratio). In 1987, the coverage ratio also was 94 percent.

The products primary to industry 2813, no matter in what industry they were produced, appear in table 6a and aggregate to \$3.1 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and energy used by establishments classified in the industrial gases industry amounted to \$1.0 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with less than 15 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 5 percent of the total value of shipments.

INDUSTRY 2816, INORGANIC PIGMENTS

This industry is made up of establishments primarily engaged in manufacturing inorganic pigments. Important products of this industry include black pigments, except carbon black, white pigments, and color pigments. Organic color pigments, except animal black and bone black, are classified in industry 2865, and those manufacturing carbon black are classified in industry 2895. Products of this industry also are collected in the Current Industrial Reports (CIR) MA-28A, MQ-28A, and M-28AT, Inorganic Chemicals (annual, quarterly, and monthly reports). For information regarding the CIR, see Contacts for Data Users at the end of the Census of Manufactures section.

The 1992 definition of this industry is the same as that used in the 1987 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1992 Census of Manufactures, Industry 2816, Inorganic Pigments, had employment of 8.6 thousand. The employment figure was 4 percent above the 8.3 thousand reported in 1987. Compared with 1991, employment increased 2 percent. The 1991 data are based on the Census Bureau's annual survey of manufactures (ASM), which is a sample survey conducted each year between censuses.

The leading States in employment in 1992 were Mississippi, Maryland, Tennessee, and Georgia, accounting for approximately 50 percent of the industry's employment. This represents a shift from 1987 when Maryland, Pennsylvania, Tennessee, and Mississippi accounted for approximately 50 percent of the industry's employment.

The total value of shipments for establishments classified in this industry was \$3.3 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry in which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 2816 shipped \$3.1 billion of inorganic pigments considered primary to the industry, \$153.9 million of secondary products, and had \$64.5 million of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in this industry was 95 percent (specialization ratio). In 1987, the specialization ratio was 94 percent.

Establishments in this industry also accounted for 89 percent of products considered primary to the industry no matter where they were actually produced (coverage ratio). In 1987, the coverage ratio also was 89 percent.

The products primary to industry 2816, no matter in what industry they were produced, appear in table 6a and aggregate to \$3.5 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and energy used by establishments classified in the inorganic pigments industry amounted to \$1.3 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with less than 10 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 2 percent of the total value of shipments.

INDUSTRY 2819, INDUSTRIAL INORGANIC CHEMICALS, N.E.C.

This industry is made up of establishments primarily engaged in manufacturing industrial inorganic chemicals, not elsewhere classified. Establishments primarily engaged in mining, milling, or otherwise preparing natural potassium, sodium, or boron compounds (other than common salt) are classified in industry 1474. Establishments primarily engaged in manufacturing household bleaches are classified in industry 2842; those manufacturing phosphoric acid are classified in industry 2874; and those manufacturing nitric acid, anhydrous ammonia, and other nitrogenous fertilizer materials are classified in industry 2873. Products of this industry also are collected in the Current Industrial Reports (CIR) MA-28A and MQ-28A, Inorganic Chemicals (annual and quarterly), and MA-28B and MQ-28B, Inorganic Fertilizer Materials and Related Products (annual and quarterly). Beginning with 1954, statistics include

information for government-owned, contractor-operated (GOCO) establishments, but exclude the activities of government-owned and/or operated plants. General statistics are shown for all plants (private and government) in table 1a and for privately owned and operated plants only in table 8. Data for all materials consumed, except fuels and electric energy, as well as data for fixed assets, capital expenditures, and inventories are excluded for the GOCO plants because these are paid for by current billings to the U.S. Government. Value of shipments and value added by manufacture have been estimated for the GOCO plants from averages reported for commercial establishments in prior years. These establishments represent 49 percent of the industry's employment in 1992, compared with 47 percent in 1987. For information regarding the CIR, see Contacts for Data Users at the end of the Census of Manufactures section.

The 1992 definition of this industry is the same as that used in the 1987 Standard Industrial Classification (SIC) system. The SIC number and title also are the same.

In the 1992 Census of Manufactures, Industry 2819, Industrial Inorganic Chemicals, N.E.C., had employment of 79.1 thousand. The employment figure was 10 percent above the 72.2 thousand reported in 1987.

The leading States in employment in 1992 were South Carolina, Tennessee, Washington, and Texas. This represents a shift from 1987 when South Carolina, Tennessee, Washington, and Ohio were the leading States.

The total value of shipments for establishments classified in this industry was \$18.2 billion.

Establishments in virtually all industries ship secondary products as well as products primary to the industry in which they are classified and have some miscellaneous receipts, such as resales and contract receipts. Industry 2819 shipped \$10.5 billion of industrial inorganic chemicals, not elsewhere classified, considered primary to the industry, \$979.2 million of secondary products, and had \$6.7 billion of miscellaneous receipts, resales, and contract work. Thus, the ratio of primary products to the total of both secondary and primary products shipped by establishments in this industry was 91 percent (specialization ratio). In 1987, the specialization ratio also was 91 percent.

Establishments in this industry also accounted for 82 percent of products considered primary to the industry no matter where they were actually produced (coverage ratio). In 1987, the coverage ratio was 80 percent.

The products primary to industry 2819, no matter in what industry they were produced, appear in table 6a and aggregate to \$12.7 billion. For further explanation of specialization and coverage ratios, see table 5b and the appendixes.

The total cost of materials, services, and fuels and energy used by establishments classified in the industrial inorganic chemicals, not elsewhere classified, industry amounted to \$7.0 billion. Data on specific materials consumed appear in table 7.

Single-establishment companies in this industry with less than 15 employees were excluded from the mail portion of the census. The data for these establishments (and a small number of larger establishments whose reports were not received at the time the data were

tabulated) were obtained from administrative records of other agencies or developed from industry averages. These establishments accounted for 5 percent of the total value of shipments.

Table 1a. Historical Statistics for the Industry: 1992 and Earlier Years

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year ¹	All establishments ³			All employees		Production workers			Value added by manufacture ⁴ (million dollars)	Cost of materials ⁵ (million dollars)	Value of shipments (million dollars)	New capital expenditures ⁶ (million dollars)	End-of-year inventories ⁴ (million dollars)	Ratios	
	Companies ² (no.)	Total (no.)	With 20 employees or more (no.)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						Specialization ⁷ (per cent)	Coverage ⁸ (per cent)
INDUSTRY 2812, ALKALIES AND CHLORINE															
1992 Census ---	34	51	33	8.0	353.3	5.4	11.3	232.0	1 408.1	1 393.4	2 786.9	176.2	213.7	76	75
1991 ASM -----	(NA)	(NA)	(NA)	7.5	303.5	5.2	11.0	199.7	1 394.1	1 347.6	2 728.9	144.6	187.4	(NA)	(NA)
1990 ASM -----	(NA)	(NA)	(NA)	6.8	263.3	4.7	10.1	175.7	1 449.9	1 322.3	2 709.8	127.0	154.2	(NA)	(NA)
1989 ASM -----	(NA)	(NA)	(NA)	6.5	248.7	4.6	10.0	166.7	1 490.8	1 202.7	2 699.0	155.6	142.3	(NA)	(NA)
1988 ASM -----	(NA)	(NA)	(NA)	6.5	237.5	4.4	9.4	158.9	1 324.1	1 159.9	2 469.3	104.2	148.2	(NA)	(NA)
1987 Census ---	27	45	31	5.0	165.3	3.5	7.3	110.0	732.1	809.0	1 547.9	68.4	110.9	86	65
1986 ASM -----	(NA)	(NA)	(NA)	6.7	218.3	4.5	9.0	137.2	1 028.0	957.9	2 010.9	122.1	131.2	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	8.2	263.2	5.6	11.2	168.0	1 073.7	978.4	2 042.4	175.2	163.9	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	7.4	239.7	5.1	10.6	161.8	869.6	984.0	1 872.4	149.5	171.3	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	7.3	217.9	4.8	9.8	136.8	765.0	898.6	1 666.8	200.3	181.0	(NA)	(NA)
1982 Census ---	35	51	33	7.6	215.7	5.0	9.8	134.9	728.8	856.3	1 570.5	134.4	199.9	81	53
1981 ASM -----	(NA)	(NA)	(NA)	7.5	201.7	4.9	10.0	124.9	703.7	852.5	1 542.9	199.1	125.2	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	7.4	177.1	5.0	9.0	110.5	584.1	777.9	1 354.1	131.7	113.2	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	7.5	164.1	5.0	10.0	101.9	548.8	661.4	1 210.7	134.9	85.4	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	10.8	216.9	7.3	15.0	139.6	712.8	869.1	1 586.3	284.6	118.1	(NA)	(NA)
1977 Census ---	30	49	33	11.8	215.9	8.0	16.0	136.2	822.5	826.7	1 654.8	220.0	141.8	63	58
INDUSTRY 2813, INDUSTRIAL GASES															
1992 Census ---	112	592	122	7.7	261.8	4.2	9.1	133.3	2 076.2	1 012.2	3 095.7	146.3	65.5	96	94
1991 ASM -----	(NA)	(NA)	(NA)	9.2	300.2	4.9	10.4	149.0	2 047.0	1 148.9	3 193.9	289.7	117.5	(NA)	(NA)
1990 ASM -----	(NA)	(NA)	(NA)	9.0	282.8	4.8	9.7	141.2	1 919.2	1 154.2	3 051.1	177.8	151.7	(NA)	(NA)
1989 ASM -----	(NA)	(NA)	(NA)	8.5	261.4	4.7	10.0	140.0	1 713.5	1 087.2	2 731.5	121.0	119.2	(NA)	(NA)
1988 ASM -----	(NA)	(NA)	(NA)	8.1	245.3	4.4	9.4	127.0	1 589.1	1 134.4	2 721.2	73.0	125.8	(NA)	(NA)
1987 Census ---	103	594	135	8.1	241.4	4.0	8.5	115.3	1 572.5	1 052.9	2 617.8	104.3	124.1	98	94
1986 ASM -----	(NA)	(NA)	(NA)	8.6	248.4	4.0	8.8	112.0	1 386.7	1 002.6	2 401.9	122.1	90.7	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	8.5	223.3	4.5	10.5	115.0	1 466.7	949.1	2 416.0	212.5	87.7	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	7.9	197.2	4.4	9.7	104.1	1 290.3	1 073.0	2 363.5	263.9	80.5	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	7.2	168.1	3.9	8.8	90.2	1 169.6	959.9	2 111.9	107.5	82.9	(NA)	(NA)
1982 Census ---	105	563	105	7.3	174.0	4.3	9.9	100.8	1 055.3	967.2	2 019.3	223.7	61.0	98	91
1981 ASM -----	(NA)	(NA)	(NA)	8.8	175.1	5.4	10.9	107.3	1 025.8	838.7	1 857.5	168.1	54.3	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	8.1	153.4	5.2	10.3	92.4	889.0	658.5	1 539.6	209.2	43.2	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	7.3	123.9	4.7	9.4	74.7	827.8	621.2	1 464.7	150.1	38.4	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	7.9	124.1	4.8	9.9	73.8	781.8	599.5	1 385.6	164.4	37.5	(NA)	(NA)
1977 Census ---	109	562	102	7.5	117.2	4.6	9.6	67.0	732.8	515.9	1 234.6	243.0	45.6	97	93
INDUSTRY 2816, INORGANIC PIGMENTS															
1992 Census ---	73	89	53	8.6	347.7	5.6	12.4	211.2	2 017.6	1 326.0	3 305.6	508.9	524.9	95	89
1991 ASM -----	(NA)	(NA)	(NA)	8.4	324.1	5.1	11.0	176.7	1 671.1	1 285.1	2 939.0	223.2	522.7	(NA)	(NA)
1990 ASM -----	(NA)	(NA)	(NA)	8.5	298.9	5.3	11.3	165.5	1 930.8	1 282.6	3 203.9	353.5	521.8	(NA)	(NA)
1989 ASM -----	(NA)	(NA)	(NA)	8.7	287.2	5.1	10.0	150.3	1 848.0	1 247.5	3 072.8	357.0	468.5	(NA)	(NA)
1988 ASM -----	(NA)	(NA)	(NA)	8.9	295.2	5.4	11.3	161.0	1 642.4	1 189.6	2 764.2	145.4	445.9	(NA)	(NA)
1987 Census ---	70	92	55	8.3	266.8	5.1	10.5	148.9	1 398.1	1 001.6	2 388.3	115.3	356.0	94	89
1986 ASM -----	(NA)	(NA)	(NA)	9.1	277.5	5.6	11.5	155.6	1 152.9	1 036.5	2 192.5	80.3	336.9	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	9.7	275.2	6.0	12.0	155.6	1 044.0	1 017.8	2 077.1	100.8	340.2	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	9.5	257.7	6.0	11.9	143.9	864.6	1 030.3	1 890.4	94.4	332.4	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	10.8	291.6	6.6	13.4	161.8	758.1	1 014.1	1 779.8	93.6	368.5	(NA)	(NA)
1982 Census ---	86	106	63	11.2	271.3	6.8	13.3	148.6	723.0	892.8	1 630.0	128.9	383.2	88	88
1981 ASM -----	(NA)	(NA)	(NA)	11.8	261.6	7.4	14.8	144.9	789.3	986.9	1 754.1	86.7	356.9	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	11.9	239.6	7.5	15.3	136.7	709.0	873.7	1 556.9	80.6	319.6	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	11.3	208.4	7.6	15.8	126.3	667.5	809.0	1 486.8	80.3	242.8	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	12.1	198.1	8.2	16.8	124.0	564.9	798.6	1 366.4	69.8	272.8	(NA)	(NA)
1977 Census ---	71	106	66	11.9	179.8	8.0	16.4	110.2	567.9	695.9	1 259.9	124.3	251.5	88	84
INDUSTRY 2819, INDUSTRIAL INORGANIC CHEMICALS, N.E.C.															
1992 Census ---	446	697	327	79.1	3 270.5	39.8	87.5	1 424.5	11 208.2	6 962.9	18 169.1	722.5	1 633.2	91	82
1991 ASM -----	(NA)	(NA)	(NA)	78.9	3 156.7	41.0	88.5	1 424.7	10 611.5	7 078.9	17 648.9	718.9	1 602.2	(NA)	(NA)
1990 ASM -----	(NA)	(NA)	(NA)	76.6	2 998.1	40.0	83.4	1 308.8	10 799.8	7 374.5	17 719.0	670.6	1 567.3	(NA)	(NA)
1989 ASM -----	(NA)	(NA)	(NA)	73.4	2 694.4	39.1	78.7	1 194.9	9 481.8	6 201.1	15 654.2	703.9	1 401.5	(NA)	(NA)
1988 ASM -----	(NA)	(NA)	(NA)	72.2	2 485.8	38.0	83.3	1 116.3	8 285.6	5 920.7	14 154.7	515.8	1 291.2	(NA)	(NA)
1987 Census ---	428	662	308	72.2	2 425.2	37.5	75.2	1 138.9	7 537.7	5 639.5	13 219.8	506.1	1 306.1	91	80
1986 ASM -----	(NA)	(NA)	(NA)	75.0	2 398.8	39.8	82.2	1 159.1	7 405.3	5 504.0	12 885.4	487.3	1 410.9	(NA)	(NA)
1985 ASM -----	(NA)	(NA)	(NA)	78.6	2 451.9	42.3	86.4	1 183.1	7 500.5	6 074.5	13 724.6	550.8	1 566.7	(NA)	(NA)
1984 ASM -----	(NA)	(NA)	(NA)	78.8	2 344.5	43.0	87.0	1 160.7	7 391.8	6 374.4	13 771.6	477.6	1 605.1	(NA)	(NA)
1983 ASM -----	(NA)	(NA)	(NA)	80.3	2 184.2	44.8	87.5	1 090.3	6 511.9	5 717.8	12 199.6	418.7	1 628.9	(NA)	(NA)
1982 Census ---	425	645	319	81.7	2 134.2	45.7	91.0	1 077.3	6 321.4	5 837.1	12 060.4	512.5	1 705.1	91	77
1981 ASM -----	(NA)	(NA)	(NA)	85.9	2 068.4	48.1	99.2	1 054.6	6 754.8	6 185.1	12 790.2	657.6	1 591.0	(NA)	(NA)
1980 ASM -----	(NA)	(NA)	(NA)	87.2	1 894.0	49.9	101.6	1 003.6	6 590.6	5 579.7	12 095.5	598.5	1 223.2	(NA)	(NA)
1979 ASM -----	(NA)	(NA)	(NA)	80.4	1 614.3	47.7	99.7	885.6	5 583.5	5 060.8	10 623.3	596.5	1 083.5	(NA)	(NA)
1978 ASM -----	(NA)	(NA)	(NA)	82.1	1 519.8	48.9	100.1	818.7	4 878.0	4 966.5	9 801.4	578.4	1 020.3	(NA)	(NA)
1977 Census ---	346	564	288	78.2	1 326.7	47.0	96.2	717.9	4 333.1	4 344.0	8 615.7	466.4	858.4	87	77

¹In annual survey of manufactures (ASM) years, data are estimates based on a representative sample of establishments canvassed annually and may differ from results of a complete canvass of all establishments. ASM publication shows percentage standard errors. Unless otherwise noted, for data prior to 1977, see 1977 Census of Manufactures, vol. II, table 1 of the industry chapter.

²For the Census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

³Includes establishments with payroll at any time during the year.

⁴Beginning in 1982, all respondents were requested to report their inventories at cost or market prior to adjustment to LIFO cost. This is a change from prior years when respondents were permitted to value their inventories using any generally accepted accounting method. Consequently, 1982 data for inventories and value added by manufacture are not comparable to prior-year data.

⁵Cost of materials is the sum of five components: the cost of (1) parts used in the manufacture of finished goods (materials, parts, containers, and supplies incorporated into products or otherwise directly consumed in the process); (2) purchased items later resold without further manufacture; (3) fuels; (4) electricity; and (5) commissions or fees to outside parties for contract manufacturing. A separate cost for each of the five components is shown in table 3a. Detailed data on materials consumed by type, are shown in table 7.

⁶Detailed data on new machinery and equipment expenditures are provided in table 3c.

⁷Represents ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for establishments classified in the industry.

⁸Represents ratio of primary products shipped by establishments classified in industry to total shipments of such products by all manufacturing establishments, wherever classified.

Table 1b. Selected Operating Ratios for the Industry: 1992 and Earlier Years

[Excludes data for auxiliaries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Payroll per employee (dollars)	Production workers as percent of total employment (percent)	Annual hours of production workers (number)	Average hourly earnings of production workers (dollars)	Cost of materials as percent of value of shipments (percent)	Cost of materials and payroll as percent of value of shipments (percent)	Value added per employee (dollars)	Payroll as percent of value added (percent)	Value added per production worker hour (dollars)
INDUSTRY 2812, ALKALIES AND CHLORINE									
1992 Census	44 163	68	2 093	20.53	50	63	176 013	25	124.61
1991 ASM	40 467	69	2 115	18.15	49	61	185 880	22	126.74
1990 ASM	38 721	69	2 149	17.40	49	59	213 221	18	143.55
1989 ASM	38 262	71	2 174	16.67	45	54	229 354	17	149.08
1988 ASM	36 538	68	2 136	16.90	47	57	203 708	18	140.86
1987 Census	33 060	70	2 086	15.07	52	63	146 420	23	100.29
1986 ASM	32 582	67	2 000	15.24	48	58	153 433	21	114.22
1985 ASM	32 098	68	2 000	15.00	48	61	130 939	25	95.87
1984 ASM	32 392	69	2 078	15.26	53	65	117 514	28	82.04
1983 ASM	29 849	66	2 042	13.96	54	67	104 795	28	78.06
1982 Census	28 382	66	1 960	13.77	55	68	95 895	30	74.37
1981 ASM	26 893	65	2 041	12.49	55	68	93 827	29	70.37
1980 ASM	23 932	68	1 800	12.28	57	71	78 932	30	64.90
1979 ASM	21 880	67	2 000	10.19	55	68	73 173	30	54.88
1978 ASM	20 083	68	2 055	9.31	55	68	66 000	30	47.52
1977 Census	18 297	68	2 000	8.51	50	63	69 703	26	51.41
INDUSTRY 2813, INDUSTRIAL GASES									
1992 Census	34 000	55	2 167	14.65	33	41	269 636	13	228.15
1991 ASM	32 630	53	2 122	14.33	36	45	222 500	15	196.83
1990 ASM	31 422	53	2 021	14.56	38	47	213 244	15	197.86
1989 ASM	30 753	55	2 128	14.00	40	49	201 588	15	171.35
1988 ASM	30 284	54	2 136	13.51	42	51	196 185	15	169.05
1987 Census	29 802	49	2 125	13.56	40	49	194 136	15	185.00
1986 ASM	28 884	47	2 200	12.73	42	52	161 244	18	157.58
1985 ASM	26 271	53	2 333	10.95	39	49	172 553	15	139.69
1984 ASM	24 962	56	2 205	10.73	45	54	163 329	15	133.02
1983 ASM	23 347	54	2 256	10.25	45	53	162 444	14	132.91
1982 Census	23 836	59	2 302	10.18	48	57	144 562	16	106.60
1981 ASM	19 898	61	2 019	9.84	45	55	116 568	17	94.11
1980 ASM	18 938	64	1 981	8.97	43	53	109 753	17	86.31
1979 ASM	16 973	64	2 000	7.95	42	51	113 397	15	88.06
1978 ASM	15 709	61	2 062	7.45	43	52	98 962	16	78.97
1977 Census	15 627	61	2 087	6.98	42	51	97 707	16	76.33
INDUSTRY 2816, INORGANIC PIGMENTS									
1992 Census	40 430	65	2 214	17.03	40	51	234 605	17	162.71
1991 ASM	38 583	61	2 157	16.06	44	55	198 940	19	151.92
1990 ASM	35 165	62	2 132	14.65	40	49	227 153	15	170.87
1989 ASM	33 011	59	1 961	15.03	41	50	212 414	16	184.80
1988 ASM	33 169	61	2 093	14.25	43	54	184 539	18	145.35
1987 Census	32 145	61	2 059	14.18	42	53	168 446	19	133.15
1986 ASM	30 495	62	2 054	13.53	47	60	126 692	24	100.25
1985 ASM	28 371	62	2 000	12.97	49	62	107 629	26	87.00
1984 ASM	27 126	63	1 983	12.09	55	68	91 011	30	72.66
1983 ASM	27 000	61	2 030	12.07	57	73	70 194	38	56.57
1982 Census	24 223	61	1 956	11.17	55	71	64 554	38	54.36
1981 ASM	22 169	63	2 000	9.79	56	71	66 890	33	53.33
1980 ASM	20 134	63	2 040	8.93	56	72	59 580	34	46.34
1979 ASM	18 442	67	2 079	7.99	54	68	59 071	31	42.25
1978 ASM	16 372	68	2 049	7.38	58	73	46 686	35	33.63
1977 Census	15 109	67	2 050	6.72	55	70	47 723	32	34.63
INDUSTRY 2819, INDUSTRIAL INORGANIC CHEMICALS, N.E.C.									
1992 Census	41 346	50	2 198	16.28	38	56	141 697	29	128.09
1991 ASM	40 009	52	2 159	16.10	40	58	134 493	30	119.90
1990 ASM	39 140	52	2 085	15.69	42	59	140 990	28	129.49
1989 ASM	36 708	53	2 013	15.18	40	57	129 180	28	120.48
1988 ASM	34 429	53	2 192	13.40	42	59	114 759	30	99.47
1987 Census	33 590	52	2 005	15.14	43	61	104 400	32	100.24
1986 ASM	31 984	53	2 065	14.10	43	61	98 737	32	90.09
1985 ASM	31 195	54	2 043	13.69	44	62	95 426	33	86.81
1984 ASM	29 753	55	2 023	13.34	46	63	93 805	32	84.96
1983 ASM	27 200	56	1 953	12.46	47	65	81 095	34	74.42
1982 Census	26 122	56	1 991	11.84	48	66	77 373	34	69.47
1981 ASM	24 079	56	2 062	10.63	48	64	78 636	31	68.09
1980 ASM	21 720	57	2 040	9.86	46	62	75 580	29	64.74
1979 ASM	20 078	59	2 090	8.88	48	63	69 447	29	56.00
1978 ASM	18 512	60	2 047	8.18	51	66	59 415	31	48.73
1977 Census	16 965	60	2 047	7.46	50	66	55 410	31	45.04

Note: For qualifications of data, see footnotes on table 1a.

Table 2. Industry Statistics for Selected States: 1992 and 1987

[Excludes data for auxiliaries. States with 100 employees or more are shown. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1992											1987	
	All establishments		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees ² (1,000)	Value added by manufacture (million dollars)
	Total (no.)	With 20 employees or more (no.)	Number ² (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						
INDUSTRY 2812, ALKALIES AND CHLORINE													
United States	51	33	8.0	353.3	5.4	11.3	232.0	1 408.1	1 393.4	2 786.9	176.2	5.0	732.1
Alabama	3	3	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Delaware	1	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Georgia	6	4	.3	13.0	.2	.5	10.1	50.0	60.2	110.1	6.2	.3	30.7
Kansas	1	1	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Louisiana	6	5	2.4	107.2	1.7	3.5	71.8	465.9	457.8	924.0	(D)	.7	94.8
Nevada	1	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New York	4	2	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	E	(D)
Ohio	2	2	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Oregon	1	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Texas	8	3	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Washington	3	3	.4	15.7	.3	.6	10.5	61.9	66.6	128.6	(D)	E	(D)
West Virginia	1	1	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Wyoming	2	2	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
INDUSTRY 2813, INDUSTRIAL GASES													
United States	592	122	7.7	261.8	4.2	9.1	133.3	2 076.2	1 012.2	3 095.7	146.3	8.1	1 572.5
Alabama	19	4	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
California	52	14	.9	28.5	.5	.9	13.5	125.2	88.2	214.3	(D)	F	(D)
Florida	E1 19	3	.2	5.3	.1	.2	2.8	28.1	18.0	46.3	1.1	(NA)	(NA)
Georgia	E1 16	3	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.3	(NA)	(D)
Illinois	25	4	.2	7.7	.1	.3	4.2	69.8	37.2	106.8	3.0	E	(D)
Indiana	19	6	.4	14.6	.2	.5	8.6	178.7	83.1	262.1	(D)	E	(D)
Iowa	10	1	.1	2.5	.1	.1	1.2	9.9	5.9	15.8	(D)	(NA)	(NA)
Kansas	9	2	.2	5.2	.1	.2	2.4	81.4	9.0	90.3	(D)	(NA)	(NA)
Kentucky	E1 13	1	.2	5.7	.1	.3	4.4	16.1	36.1	51.7	.5	(NA)	(NA)
Louisiana	30	6	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.5	157.2
Michigan	E1 12	2	.1	4.5	.1	.2	2.2	34.7	15.7	50.4	1.1	(NA)	(D)
New York	12	3	.2	7.6	.1	.2	2.8	48.0	15.8	63.7	.6	E	(D)
North Carolina	E1 15	5	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Ohio	31	12	.6	20.1	.3	.7	9.8	141.5	85.8	230.2	9.7	.6	115.4
Oklahoma	12	3	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Pennsylvania	37	5	.4	15.1	.3	.5	8.3	88.8	47.7	139.0	10.2	.5	80.5
South Carolina	9	4	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.2	14.6
Tennessee	E1 14	2	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Texas	63	12	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	G	(D)
Virginia	E3 15	2	.1	4.0	.1	.1	1.9	20.9	13.0	34.2	(D)	(NA)	(NA)
Washington	15	3	.2	6.3	.1	.2	2.6	32.8	13.8	46.5	3.1	(NA)	(NA)
West Virginia	15	3	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Wyoming	7	1	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
INDUSTRY 2816, INORGANIC PIGMENTS													
United States	89	53	8.6	347.7	5.6	12.4	211.2	2 017.6	1 326.0	3 305.6	508.9	8.3	1 398.1
California	6	3	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Delaware	1	1	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Georgia	7	3	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	23.5	F	(D)
Illinois	E1 6	5	.4	14.6	.3	.7	12.2	42.1	41.9	82.5	3.4	F	(D)
Indiana	2	2	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Louisiana	1	1	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Maryland	6	6	1.0	40.7	.6	1.6	23.6	162.5	155.2	310.7	(D)	G	(D)
Mississippi	2	2	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Missouri	3	3	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
New Jersey	10	3	.4	15.7	.3	.5	9.3	47.3	37.2	87.0	4.1	.6	57.1
New York	E1 4	1	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	E	(D)
Ohio	5	3	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Pennsylvania	9	7	.8	27.2	.5	1.1	17.2	79.9	83.0	160.6	7.5	1.0	96.1
Tennessee	4	3	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
Texas	3	2	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	E	(D)
Virginia	2	2	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)

See footnotes at end of table.

Table 2. Industry Statistics for Selected States: 1992 and 1987—Con.

[Excludes data for auxiliaries. States with 100 employees or more are shown. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and geographic area	1992											1987		
	E1	All establishments		All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	All employees ² (1,000)	Value added by manufacture (million dollars)
		Total (no.)	With 20 employees or more (no.)	Number ² (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)						
INDUSTRY 2819, INDUSTRIAL INORGANIC CHEMICALS, N.E.C.														
United States -----		697	327	79.1	3 270.5	39.8	87.5	1 424.5	11 208.2	6 962.9	18 169.1	722.5	72.2	7 537.7
Alabama -----		20	9	1.7	56.0	.8	1.7	27.8	223.9	271.7	502.2	27.3	1.0	121.7
Arizona -----	E1	5	4	.2	5.7	.1	.2	3.1	6.1	24.2	30.4	(D)	(NA)	(NA)
Arkansas -----		7	3	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	F	(D)
California -----		64	27	2.7	101.2	1.6	3.5	52.8	580.3	391.1	958.7	34.0	1.8	243.1
Colorado -----	E4	13	3	.2	6.1	.1	.2	2.2	15.1	15.9	32.9	(D)	(NA)	(NA)
Connecticut -----		6	3	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	E	(D)
Delaware -----		3	3	.5	21.6	.2	.7	9.3	82.7	41.4	125.8	4.8	F	(D)
Florida -----	E2	19	3	.2	5.6	.1	.3	3.3	12.1	27.2	39.5	1.4	(NA)	(D)
Georgia -----		29	15	1.1	39.7	.7	1.5	20.7	171.9	192.3	367.4	6.1	1.4	209.2
Idaho -----		5	4	H	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	2.1	254.3
Illinois -----		32	23	2.1	79.5	1.3	3.0	45.1	321.1	300.0	631.6	37.9	2.0	238.0
Indiana -----	E1	24	13	F	(D)	(D)	(D)	(D)	(D)	(D)	(D)	14.3	F	(D)
Iowa -----		4	3	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1.9	E	(D)
Kansas -----	E1	6	5	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	E	(D)
Kentucky -----		10	5	2.9	117.7	1.6	3.7	62.5	406.3	351.3	756.1	4.1	G	(D)
Louisiana -----		27	14	2.2	88.5	1.6	3.6	59.2	414.3	520.2	924.9	129.8	1.9	234.5
Maryland -----		12	7	1.1	42.4	.7	1.3	23.2	78.3	120.9	201.3	(D)	.9	54.1
Massachusetts -----		14	6	.5	20.3	.3	.6	10.9	51.4	42.7	94.1	6.0	F	(D)
Michigan -----		17	5	.7	25.7	.4	.7	11.9	90.0	49.9	139.9	9.3	F	(D)
Mississippi -----		9	5	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Missouri -----	E1	18	3	.4	15.8	.3	.6	10.3	63.9	83.7	148.0	3.1	E	(D)
Montana -----		4	3	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	.3	22.2
Nebraska -----		5	2	C	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
Nevada -----		5	2	.1	2.7	.1	.2	1.8	15.0	10.8	25.7	.6	(NA)	(NA)
New Jersey -----		34	23	2.4	99.9	1.2	2.8	42.3	421.4	612.4	1 033.8	21.2	2.3	343.7
New Mexico -----		3	3	E	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(NA)
New York -----		23	13	.8	28.7	.5	1.0	13.9	89.2	126.0	216.8	6.5	.6	51.3
North Carolina -----		18	7	2.4	99.1	1.6	3.4	62.7	387.6	184.4	542.8	44.8	2.1	264.2
Ohio -----		38	19	3.4	164.8	1.8	4.3	72.7	459.7	498.5	957.8	14.2	6.1	560.0
Oklahoma -----		18	8	.7	26.9	.5	1.2	16.7	48.9	57.2	115.6	5.8	F	(D)
Pennsylvania -----	E1	45	17	1.3	45.7	.7	1.5	21.9	163.0	138.5	299.9	14.8	1.6	183.7
South Carolina -----		10	6	J	(D)	(D)	(D)	(D)	(D)	(D)	(D)	13.5	(NA)	(D)
Tennessee -----		20	13	10.6	384.8	4.5	10.3	160.0	1 448.9	448.1	1 909.2	(D)	10.9	1 120.1
Texas -----		53	25	4.1	168.4	2.7	5.8	103.8	496.0	843.6	1 348.5	85.0	3.8	449.2
Utah -----	E1	7	3	.4	13.8	.2	.5	6.1	33.9	21.2	56.4	(D)	.2	15.5
Virginia -----		8	4	G	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(NA)	(D)
Washington -----		24	8	J	(D)	(D)	(D)	(D)	(D)	(D)	(D)	14.0	(NA)	(D)
West Virginia -----		5	3	.2	7.5	.1	.2	3.4	57.1	29.1	86.1	(D)	E	(D)
Wisconsin -----	E2	10	2	.2	6.3	.1	.3	3.5	21.8	19.7	41.2	.9	(NA)	(D)

Note: For qualifications of data, see footnotes on table 1a.

¹Payroll and sales data for some small single-establishment companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other Government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at the time data were tabulated. The following symbols are shown for those States where estimated value of shipments data based on administrative-record data account for 10 percent or more of figure shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

²Statistics for some producing States have been withheld to avoid disclosing data for individual companies. However, for States with 100 employees or more, number of establishments is shown and employment-size range is indicated by one of the following symbols: C—100 to 249 employees; E—250 to 499 employees; F—500 to 999 employees; G—1,000 to 2,499 employees; H—2,500 to 4,999 employees; I—5,000 to 9,999 employees; J—10,000 to 24,999 employees; K—25,000 to 49,999 employees; L—50,000 to 99,999 employees; M—100,000 employees or more.

Table 3a. Summary Statistics for the Industry: 1992

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Alkalies and chlorine (SIC 2812)	Industrial gases (SIC 2813)	Inorganic pigments (SIC 2816)	Industrial inorganic chemicals, n.e.c. (SIC 2819)
Companies ----- number--	34	112	73	446
All establishments ----- number--	51	592	89	697
With 1 to 19 employees ----- number--	18	470	36	370
With 20 to 99 employees ----- number--	13	118	31	225
With 100 employees or more ----- number--	20	4	22	102
Employment and labor costs:				
Employees -----1,000--	8.0	7.7	8.6	79.1
Compensation, total -----mil dol--	466.4	345.0	435.7	4 134.3
Annual payroll -----mil dol--	353.3	261.8	347.7	3 270.5
Fringe benefits -----mil dol--	113.2	83.2	88.0	863.9
Social Security and other legally required payments -----mil dol--	37.2	27.7	33.4	314.7
Employer voluntary payments -----mil dol--	76.0	55.5	54.6	549.2

See footnotes at end of table.

28A-10 INDUSTRIAL INORGANIC CHEMICALS

MANUFACTURES—INDUSTRY SERIES

Table 3a. Summary Statistics for the Industry: 1992—Con.

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Alkalies and chlorine (SIC 2812)	Industrial gases (SIC 2813)	Inorganic pigments (SIC 2816)	Industrial inorganic chemicals, n.e.c. (SIC 2819)
Production workers:				
Average for year -----1,000--	5.4	4.2	5.6	39.8
March -----1,000--	5.4	4.2	5.7	40.0
May -----1,000--	5.4	4.2	5.6	40.1
August -----1,000--	5.5	4.2	5.6	39.8
November -----1,000--	5.4	4.1	5.5	39.2
Hours ----- millions--	11.3	9.1	12.4	87.5
Wages ----- mil dol--	232.0	133.3	211.2	1 424.5
Cost of materials¹ ----- mil dol--				
Materials, parts, containers, etc., consumed ² ----- mil dol--	1 393.4	1 012.2	1 326.0	6 962.9
Resales ----- mil dol--	696.7	229.4	1 107.0	5 018.1
Fuels ----- mil dol--	12.4	32.8	48.5	311.2
Purchased electricity ----- mil dol--	190.2	66.0	76.6	368.3
Contract work ----- mil dol--	428.8	671.6	89.9	916.1
	65.3	12.4	3.9	349.1
Quantity of electric energy used for heat and power:				
Purchased ----- mil kWh--	14 898.8	18 151.7	2 300.5	37 008.8
Generated less sold ----- mil kWh--	(D)	(D)	(D)	1 272.0
Total value of shipments ----- mil dol--	2 786.9	3 095.7	3 305.6	18 169.1
Value added ----- mil dol--	1 408.1	2 076.2	2 017.6	11 208.2
Inventories by stage of fabrication:				
Beginning of 1992 ----- mil dol--	204.6	79.4	508.8	1 700.6
Finished goods ----- mil dol--	102.3	52.7	199.7	709.3
Work in process ----- mil dol--	5.1	.4	31.1	363.0
Materials and supplies ----- mil dol--	97.2	26.2	278.0	628.3
End of 1992 ----- mil dol--	213.7	65.5	524.9	1 633.2
Finished goods ----- mil dol--	118.1	45.4	224.8	679.9
Work in process ----- mil dol--	4.0	.6	44.0	394.3
Materials and supplies ----- mil dol--	91.6	19.6	256.0	558.9

Note: For qualifications of data, see footnotes on table 1a.

¹Data on purchased services for the repair of buildings and machinery and for communication services are not included in cost of materials, etc., but are shown in table 3c.

²Data on materials consumed by type are shown in table 7. Data on amount purchased or transferred from foreign sources are shown in table 3c.

Table 3b. Gross Book Value of Depreciable Assets, Capital Expenditures, Retirements, Depreciation, and Rental Payments: 1992

[Million dollars. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Alkalies and chlorine (SIC 2812)	Industrial gases (SIC 2813)	Inorganic pigments (SIC 2816)	Industrial inorganic chemicals, n.e.c. (SIC 2819)
Gross book value of depreciable assets:				
Total:				
Beginning of year -----	3 278.5	5 868.2	2 343.1	9 914.4
New capital expenditures ¹ -----	176.2	146.3	508.9	722.5
Used capital expenditures -----	1.0	(D)	(D)	16.6
Retirements -----	44.7	(D)	(D)	265.1
End of year -----	3 411.0	5 957.9	2 801.8	10 388.5
Buildings and other structures:				
Beginning of year -----	297.3	173.4	286.1	1 564.5
New capital expenditures -----	9.1	6.8	101.6	83.4
Used capital expenditures -----	.1	(D)	(D)	3.7
Retirements -----	3.2	(D)	(D)	21.8
End of year -----	303.2	175.2	375.6	1 629.8
Machinery and equipment:				
Beginning of year -----	2 981.3	5 694.8	2 057.0	8 349.9
New capital expenditures ¹ -----	167.1	139.5	407.3	639.2
Used capital expenditures -----	.9	(D)	(D)	12.9
Retirements -----	41.5	(D)	(D)	243.3
End of year -----	3 107.8	5 782.7	2 426.2	8 758.7
Depreciation charges during 1992:				
Total -----	218.7	395.5	167.1	659.4
Buildings and other structures -----	15.3	12.4	16.9	74.0
Machinery and equipment -----	203.4	383.1	150.3	585.5
Rental payments:				
Total -----	10.6	11.7	10.2	55.7
Buildings and other structures -----	4.0	5.7	3.2	23.3
Machinery and equipment -----	6.5	6.0	7.0	32.4

¹Data on new machinery and equipment expenditures by type are provided in table 3c.

Table 3c. Supplemental Industry Statistics Based on Sample Estimates: 1992

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Item	Alkalies and chlorine (SIC 2812)		Industrial gases (SIC 2813)		Inorganic pigments (SIC 2816)		Industrial inorganic chemicals, n.e.c. (SIC 2819)	
	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)	Amount (million dollars)	Relative standard error of estimate ¹ (percent)
Purchased services:								
Cost of purchased services for the repair of—								
Buildings and other structures	6.8	(X)	2.7	(X)	7.3	(X)	43.4	(X)
Response coverage ratio (percent) ²	69.2	(X)	94.2	(X)	88.6	(X)	67.6	(X)
Machinery	71.3	(X)	53.6	(X)	39.8	(X)	193.5	(X)
Response coverage ratio (percent) ²	75.6	(X)	95.7	(X)	93.1	(X)	66.6	(X)
Other purchased services:								
Communications	2.7	(X)	2.9	(X)	4.1	(X)	13.0	(X)
Response coverage ratio (percent) ²	76.8	(X)	90.9	(X)	95.4	(X)	67.9	(X)
Legal8	(X)	.9	(X)	1.2	(X)	11.9	(X)
Response coverage ratio (percent) ²	68.0	(X)	94.2	(X)	93.1	(X)	67.3	(X)
Accounting and bookkeeping5	(X)	4.4	(X)	1.0	(X)	3.4	(X)
Response coverage ratio (percent) ²	62.7	(X)	94.0	(X)	87.1	(X)	67.5	(X)
Advertising	(Z)	(X)	.5	(X)	2.6	(X)	3.9	(X)
Response coverage ratio (percent) ²	63.6	(X)	93.3	(X)	87.1	(X)	66.9	(X)
Software and other data processing	1.8	(X)	.4	(X)	2.2	(X)	6.4	(X)
Response coverage ratio (percent) ²	72.2	(X)	94.9	(X)	91.4	(X)	68.0	(X)
Refuse removal, including hazardous waste	16.7	(X)	.9	(X)	23.2	(X)	54.3	(X)
Response coverage ratio (percent) ²	76.5	(X)	90.7	(X)	95.5	(X)	68.2	(X)
New machinery and equipment expenditures	167.1	(X)	139.5	(X)	407.3	(X)	639.2	(X)
Automobiles, trucks, etc., for highway use	2.5	8	8.3	1	.3	1	4.8	25
Computers and peripheral data processing equipment	2.3	1	2.8	1	10.3	1	19.6	3
All other	139.5	1	128.4	1	396.6	1	614.8	1
Adjustment ratio ³	1.2	(X)	1.3	(X)	1.1	(X)	1.3	(X)
Cost of materials, components, parts, etc., used	696.7	(X)	229.4	(X)	1 107.0	(X)	5 018.1	(X)
Materials purchased or transferred from foreign sources ⁴	33.5	3	—	(X)	340.9	3	806.6	4
Materials purchased or transferred from domestic sources	663.2	1	229.4	1	766.1	1	4 211.6	1
Adjustment ratio ³	1.9	(X)	1.2	(X)	1.5	(X)	1.6	(X)

Note: The amounts shown for purchased services reflect only those services that establishments purchase from other companies. Amounts purchased by separate central administrative offices and services provided to establishments by central administrative offices are excluded.

¹For description of relative standard error of estimate, see Qualifications of the Data in appendixes.

²A response coverage ratio is derived for this item by calculating the ratio of the weighted employment (establishment data multiplied by sample weight, see appendix B) for those ASM establishments that reported to the weighted total employment for all ASM establishments classified in the industry.

³Detail has been adjusted upwards to account for nonresponse. Inverse of the ratio shown represents a measure of the response of the inquiry. (See appendixes for further explanation.)

⁴Data may understate the true cost of imported parts, components, and supplies since some respondents do not know the origin of these materials. Includes cases where materials were purchased from secondary suppliers or where they were transferred from company-operated warehouses or other distribution points. Direct purchases from foreign suppliers and importers by domestic manufacturing establishments are believed to be reported accurately.

Table 4. Industry Statistics by Employment Size of Establishment: 1992

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and employment size class	E ¹	All establishments (no.)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
INDUSTRY 2812, ALKALIES AND CHLORINE												
Total	—	51	8.0	353.3	5.4	11.3	232.0	1 408.1	1 393.4	2 786.9	176.2	213.7
Establishments with an average of—												
1 to 4 employees	E6	11	(Z)	.9	(Z)	(Z)	.6	6.6	4.2	10.7	.4	.6
5 to 9 employees	—	1	2	6.3	1	2	4.1	19.0	27.8	46.4	(D)	4.0
10 to 19 employees	E2	6	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	2.2	(D)
20 to 49 employees	—	3	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
50 to 99 employees	—	10	.7	32.2	.5	1.1	21.2	207.1	185.7	390.9	15.9	18.9
100 to 249 employees	—	13	2.8	118.1	1.9	4.0	79.9	613.8	644.7	1 248.7	81.0	100.7
250 to 499 employees	—	2	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
500 to 999 employees	—	4	4.3	195.7	2.9	6.0	126.1	561.6	531.1	1 090.0	76.8	89.6
1,000 to 2,499 employees	—	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
INDUSTRY 2813, INDUSTRIAL GASES												
Total	—	592	7.7	261.8	4.2	9.1	133.3	2 076.2	1 012.2	3 095.7	146.3	65.5
Establishments with an average of—												
1 to 4 employees	E1	260	.4	13.8	.3	.6	9.2	164.7	69.2	236.1	8.7	7.5
5 to 9 employees	—	102	.7	23.0	.5	1.2	16.2	270.7	143.4	414.2	23.4	9.9
10 to 19 employees	E1	108	1.4	48.6	.9	2.0	30.2	403.2	199.6	602.6	24.3	13.8
20 to 49 employees	—	90	2.7	92.2	1.3	2.7	38.2	572.1	296.3	872.6	34.7	17.0
50 to 99 employees	—	28	1.9	62.4	.7	1.6	23.5	425.5	166.4	592.5	39.8	11.7
100 to 249 employees	—	4	.5	21.8	.4	.9	16.1	239.9	137.2	377.6	15.4	5.7
Covered by administrative records ²	E9	27	.1	1.0	(Z)	.1	.5	6.1	3.5	9.6	.6	.3

See footnotes at end of table.

28A-12 INDUSTRIAL INORGANIC CHEMICALS

MANUFACTURES—INDUSTRY SERIES

Table 4. Industry Statistics by Employment Size of Establishment: 1992—Con.

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry and employment size class	E ¹	All establishments (no.)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)	End-of-year inventories (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)					
INDUSTRY 2816, INORGANIC PIGMENTS												
Total	—	89	8.6	347.7	5.6	12.4	211.2	2 017.6	1 326.0	3 305.6	508.9	524.9
Establishments with an average of—												
1 to 4 employees	E7	10	(Z)	.5	(Z)	(Z)	.3	3.4	2.4	5.7	.5	.9
5 to 9 employees	E7	18	.1	3.9	.1	.2	1.9	17.9	13.1	31.2	5.0	4.5
10 to 19 employees	E4	8	.1	3.1	.1	.1	1.6	20.2	14.9	35.0	1.9	7.4
20 to 49 employees	—	20	.7	20.3	.5	1.0	12.1	63.0	110.8	174.0	7.1	20.6
50 to 99 employees	—	11	.8	29.4	.6	1.2	17.9	133.5	100.4	227.7	10.7	55.9
100 to 249 employees	—	8	1.2	43.5	.8	1.7	25.4	170.4	151.1	317.5	14.2	61.3
250 to 499 employees	—	11	5.7	247.0	3.6	8.1	152.0	1 609.3	933.3	2 514.4	469.5	374.4
500 to 999 employees	—	3	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ²	E9	9	(Z)	.4	(Z)	(Z)	.2	2.1	1.4	3.5	.4	.5
INDUSTRY 2819, INDUSTRIAL INORGANIC CHEMICALS, N.E.C.												
Total	—	697	79.1	3 270.5	39.8	87.5	1 424.5	11 208.2	6 962.9	18 169.1	722.5	1 633.2
Establishments with an average of—												
1 to 4 employees	E3	145	.3	9.1	.2	.4	4.4	43.5	41.6	84.6	3.9	6.6
5 to 9 employees	E2	135	.9	28.5	.6	1.2	14.5	134.2	143.3	276.7	7.2	23.0
10 to 19 employees	E2	90	1.3	42.3	.7	1.6	21.5	174.8	152.3	323.4	13.0	34.8
20 to 49 employees	E1	140	4.4	152.4	2.7	5.7	79.6	629.1	689.8	1 332.2	76.9	162.3
50 to 99 employees	E1	85	5.9	224.8	3.3	7.2	110.0	887.0	1 097.0	1 965.0	84.3	243.8
100 to 249 employees	—	62	9.9	399.6	5.8	12.8	214.8	1 704.4	1 920.1	3 634.8	199.9	456.8
250 to 499 employees	—	16	5.3	208.7	3.3	7.4	118.9	712.7	604.1	1 326.8	144.1	131.2
500 to 999 employees	—	15	10.3	409.0	6.0	13.1	218.5	1 462.1	1 259.5	2 733.8	193.3	445.0
1,000 to 2,499 employees	—	6	40.9	1 796.0	17.1	38.2	642.5	5 460.3	1 055.4	6 491.9	(D)	129.6
2,500 employees or more	—	3	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Covered by administrative records ²	E9	139	.5	12.0	.3	.6	5.2	33.7	19.9	53.6	1.8	4.7

Note: For qualifications of data, see footnotes on table 1a. Data shown as (D) are included in underscored figures above.

¹Payroll and sales data for some small single-establishment manufacturing companies with up to 20 employees (cutoff varied by industry) were obtained from administrative records of other Government agencies rather than from census report forms. These data were then used in conjunction with industry averages to estimate the items shown for these small establishments. This technique was also used for a small number of other establishments whose reports were not received at the time data were tabulated. The following symbols are shown for those employment-size classes where estimated data based on administrative-record data account for 10 percent or more of figures shown: E1—10 to 19 percent; E2—20 to 29 percent; E3—30 to 39 percent; E4—40 to 49 percent; E5—50 to 59 percent; E6—60 to 69 percent; E7—70 to 79 percent; E8—80 to 89 percent; E9—90 percent or more.

²Report forms were not mailed to small single-establishment companies with up to 20 employees (cutoff varied by industry). Payroll and sales data for 1992 were obtained from administrative records supplied by other agencies of the Federal Government. Those data were then used in conjunction with industry averages to estimate the items shown. Data are also included in respective employment-size classes shown.

Table 5a. Industry Statistics by Industry and Primary Product Class Specialization: 1992

[Table presents selected statistics for establishments according to their degree of specialization in products primary to their industry. Measures of plant specialization shown are (1) industry specialization: ratio of primary product shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment; and (2) product class specialization: ratio of largest primary product class shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment. See appendix for method of computing ratios. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry or product class code	Industry or primary product class	All establishments (number)	All employees		Production workers			Value added by manufacture (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	New capital expenditures (million dollars)
			Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				
2812	Alkalies and chlorine:										
	All establishments in industry	51	8.0	353.3	5.4	11.3	232.0	1 408.1	1 393.4	2 786.9	176.2
	Establishments with this product class primary:										
28123	Sodium hydroxide (caustic soda)	27	7.1	316.4	4.8	10.0	206.7	1 112.9	1 189.9	2 293.1	152.0
28125	Other alkalies	11	.8	34.4	.6	1.2	23.6	284.8	196.4	476.2	23.2
2813	Industrial gases:										
	All establishments in industry	592	7.7	261.8	4.2	9.1	133.3	2 076.2	1 012.2	3 095.7	146.3
	Establishments with this product class primary:										
28132	Acetylene	70	.8	23.9	.6	1.2	17.5	34.1	54.7	88.6	6.1
28133	Carbon dioxide	74	1.0	29.1	.4	.8	11.8	180.7	68.3	248.8	11.0
28135	Nitrogen	230	2.8	102.1	1.3	2.8	44.3	814.4	376.4	1 193.6	45.9
28136	Oxygen	58	1.0	37.9	.6	1.3	19.7	471.2	247.9	722.2	15.4
28137	Other industrial gases, n.e.c.	71	1.5	51.8	1.0	2.2	31.6	484.3	211.2	697.3	60.6
2816	Inorganic pigments:										
	All establishments in industry	89	8.6	347.7	5.6	12.4	211.2	2 017.6	1 326.0	3 305.6	508.9
	Establishments with this product class primary:										
28161	Titanium dioxide	10	4.4	200.3	3.0	6.7	126.0	1 487.0	877.6	2 339.6	459.6
28162	Other white opaque pigments	12	.7	21.6	.4	.9	12.3	71.9	111.7	180.2	8.9
28163	Chrome colors and other inorganic pigments	36	3.4	119.1	2.1	4.4	69.3	420.7	309.2	720.5	32.7
2819	Industrial inorganic chemicals, n.e.c.:										
	All establishments in industry	697	79.1	3 270.5	39.8	87.5	1 424.5	11 208.2	6 962.9	18 169.1	722.5
	Establishments with this product class primary:										
28193	Sulfuric acid	29	1.3	54.2	.8	1.9	33.1	294.1	196.0	490.6	40.7
28194	Inorganic acids, except nitric, sulfuric, and phosphoric	14	.7	31.2	.4	.8	17.5	79.6	221.6	298.0	27.8
28195	Aluminum oxide	10	3.6	145.0	2.6	5.6	99.8	241.2	827.6	1 084.6	58.4
28196	Other inorganic aluminum compounds	74	1.6	55.4	.9	1.8	27.8	150.6	226.8	377.1	14.0
28197	Inorganic potassium and sodium compounds, n.e.c.	61	5.9	237.0	3.6	8.2	133.6	1 102.4	1 103.8	2 216.4	118.4
28198	Chemical catalytic preparations	26	4.1	181.9	2.5	5.7	100.9	737.7	635.9	1 366.8	140.5
28199	Other inorganic chemicals, n.e.c.	205	18.9	721.2	11.1	23.5	373.8	2 911.2	2 767.0	5 650.7	297.0

Note: For qualifications of data, see footnotes on table 1a.

Table 5b. Industry-Product Analysis—Value of Industry and Primary Product Shipments; Specialization and Coverage Ratios: 1992 and Earlier Census Years

[Million dollars. An establishment is assigned to an industry based on shipment values of products representing largest amount considered primary to an industry. Frequently, establishment shipments comprise mixtures of products assigned to an industry (primary), those considered primary to other industries (secondary), and receipts for activities such as merchandising or contract work (total miscellaneous receipts). Subtotals for total value of shipments show this product pattern for an industry. Primary products specialization ratio is the primary products value of shipments divided by the sum of primary products value of shipments plus secondary products value of shipments. The extent of which an industry's primary products are shipped by establishments classified both in and out of an industry is the coverage ratio and is calculated by dividing the primary products value of shipments by the value of primary products shipments made in all industries. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Industry	1992	1987	1982
INDUSTRY 2812, ALKALIES AND CHLORINE			
Total value of shipments	2 786.9	1 547.9	1 570.5
Primary products value of shipments	2 105.4	1 318.6	1 220.0
Secondary products value of shipments	653.2	217.9	282.7
Total miscellaneous receipts	28.3	11.5	67.8
Value of resales	15.2	(D)	47.2
Contract receipts	11.7	(D)	(D)
Other miscellaneous receipts	1.4	(D)	(D)
Primary products specialization ratio	76	86	81
Value of primary products shipments made in all industries	2 789.8	2 033.5	2 346.1
Value of primary products shipments made in this industry	2 105.4	1 318.6	1 220.0
Value of primary products shipments made in other industries	684.4	715.0	1 126.1
Coverage ratio	75	65	53
INDUSTRY 2813, INDUSTRIAL GASES			
Total value of shipments	3 095.7	2 617.8	2 019.3
Primary products value of shipments	2 926.0	2 483.7	1 830.0
Secondary products value of shipments	119.3	54.0	34.4
Total miscellaneous receipts	50.4	80.1	154.9
Value of resales	35.9	(D)	103.7
Contract receipts	(D)	(D)	(D)
Other miscellaneous receipts	(D)	(D)	(D)
Primary products specialization ratio	96	98	98
Value of primary products shipments made in all industries	3 115.1	2 631.0	2 002.2
Value of primary products shipments made in this industry	2 926.0	2 483.7	1 830.0
Value of primary products shipments made in other industries	189.2	147.3	172.2
Coverage ratio	94	94	91
INDUSTRY 2816, INORGANIC PIGMENTS			
Total value of shipments	3 305.6	2 388.3	1 630.0
Primary products value of shipments	3 087.1	2 159.2	1 398.0
Secondary products value of shipments	153.9	132.8	198.4
Total miscellaneous receipts	64.5	96.3	33.5
Value of resales	62.4	87.0	29.6
Contract receipts	(D)	(D)	2.3
Other miscellaneous receipts	(D)	(D)	1.6
Primary products specialization ratio	95	94	88
Value of primary products shipments made in all industries	3 468.2	2 425.5	1 590.7
Value of primary products shipments made in this industry	3 087.1	2 159.2	1 398.0
Value of primary products shipments made in other industries	381.1	266.2	192.7
Coverage ratio	89	89	88
INDUSTRY 2819, INDUSTRIAL INORGANIC CHEMICALS, N.E.C.			
Total value of shipments	18 169.1	13 219.8	12 060.4
Primary products value of shipments	10 456.3	8 179.7	7 438.0
Secondary products value of shipments	979.2	825.5	698.0
Total miscellaneous receipts	6 733.7	4 214.6	3 924.4
Value of resales	402.9	252.0	244.2
Contract receipts	6 285.6	3 915.6	3 480.6
Other miscellaneous receipts	45.2	47.0	199.6
Primary products specialization ratio	91	91	91
Value of primary products shipments made in all industries	12 713.7	10 266.1	9 698.2
Value of primary products shipments made in this industry	10 456.3	8 179.7	7 438.0
Value of primary products shipments made in other industries	2 257.4	2 086.4	2 260.2
Coverage ratio	82	80	77

Note: For qualifications of data, see footnotes on table 1a.

Table 6a. Product and Product Classes—Quantity and Value of Shipments by All Producers: 1992 and 1987

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For meaning of abbreviations and symbols, see introductory text]

Product code	Product	1992		1987			
		Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)	Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)		
2812--	ALKALIES AND CHLORINE						
	Total	(NA)	2 789.8	(NA)	2 033.5		
28121	Chlorine, compressed or liquefied	(NA)	198.4	(NA)	786.9		
28121 00	Chlorine, compressed or liquefied ³	16	198.4	23	786.9		
28123	Sodium hydroxide (caustic soda)	(NA)	2 206.6	(NA)	970.2		
28123 00	Sodium hydroxide (caustic soda) ³	25	2 206.6	24	970.2		
28125	Other alkalis	(NA)	365.4	(NA)	258.6		
28125 00	Other alkalis ³	17	365.4	14	258.6		
28120	Alkalies and chlorine, n.s.k.	(NA)	19.4	(NA)	17.8		
28120 00	Alkalies and chlorine, n.s.k. ⁴	(NA)	17.2	(NA)	(Z)		
28120 02	Alkalies and chlorine, n.s.k. ⁵	(NA)	2.1	(NA)	17.8		
2813--	INDUSTRIAL GASES						
	Total	(NA)	3 115.1	(NA)	2 631.0		
28132	Acetylene	(NA)	127.0	(NA)	118.4		
28132 00	Acetylene ³	37	127.0	32	118.4		
28133	Carbon dioxide	(NA)	317.2	(NA)	292.3		
28133 00	Carbon dioxide ³	41	317.2	44	292.3		
28135	Nitrogen	(NA)	947.0	(NA)	746.6		
28135 00	Nitrogen ³	21	947.0	19	746.6		
28136	Oxygen	(NA)	770.6	(NA)	617.3		
28136 00	Oxygen ³	23	770.6	23	617.3		
28137	Other industrial gases, n.e.c.	(NA)	812.9	(NA)	704.3		
28137 00	Other industrial gases, including argon, hydrogen, helium, and carbon monoxide ³	46	812.9	41	704.3		
28130	Industrial gases, n.s.k.	(NA)	140.5	(NA)	152.1		
28130 00	Industrial gases, n.s.k. ⁶	(NA)	130.9	(NA)	84.3		
28130 02	Industrial gases, n.s.k. ⁷	(NA)	9.6	(NA)	67.8		
Product code	Product	1992		1987			
		Number of companies with shipments of \$100,000 or more	Product shipments ¹		Number of companies with shipments of \$100,000 or more	Product shipments ¹	
Quantity ²	Value (million dollars)		Quantity ²	Value (million dollars)			
2816--	INORGANIC PIGMENTS						
	Total	(NA)	(X)	3 468.2	(NA)	(X)	2 425.5
28161	Titanium dioxide	(NA)	(X)	2 316.2	(NA)	(X)	1 482.2
28161 00	Titanium dioxide, composite and pure ³	5	(X)	2 316.2	(NA)	(X)	1 482.2
28162	Other white opaque pigments	(NA)	(X)	303.6	(NA)	(X)	277.1
28162 24	Zinc oxide pigments	1,000 s tons	9	114.7	7	131.5	117.1
28162 55	Titanium pigment preparations	1,000 s tons	8	5.3	(NA)	(NA)	(⁸)
28162 65	All other inorganic white opaque pigments	1,000 s tons	9	292.2	(NA)	(S)	84.5
28162 00	Other white opaque pigments, n.s.k.	(NA)	(X)	.1	(NA)	(X)	⁸ 75.6
28163	Chrome colors and other inorganic pigments	(NA)	(X)	785.0	(NA)	(X)	614.2
28163 10	Chrome colors ³	12	(X)	110.6	13	(X)	131.7
28163 27	White extender pigments, including barytes, blanc fixe, and whiting	1,000 s tons	8	(S)	5	384.0	103.7
28163 31	Iron oxide pigments	18	(X)	278.9	14	(X)	185.8
28163 88	Carbon black (bone and lamp), excluding furnace and channel carbon black and charcoal	mil lb	2	(D)	3	(S)	2.0
28163 91	Ceramic colors	mil lb	5	(S)	6	11.1	46.2
28163 98	All other inorganic pigments n.e.c.	18	(X)	⁹ 173.9	(NA)	(X)	106.1
28163 00	Chrome colors and other inorganic pigments, n.s.k.	(NA)	(X)	—	(NA)	(X)	38.7
28160	Inorganic pigments, n.s.k.	(NA)	(X)	63.4	(NA)	(X)	52.0
28160 00	Inorganic pigments, n.s.k. ⁴	(NA)	(X)	59.7	(NA)	(X)	6.5
28160 02	Inorganic pigments, n.s.k. ⁵	(NA)	(X)	3.7	(NA)	(X)	45.6

See footnotes at end of table.

Table 6a. **Product and Product Classes—Quantity and Value of Shipments by All Producers: 1992 and 1987—Con.**

[Includes quantity and value of products of this industry produced by (1) establishments classified in this industry (primary) and (2) establishments classified in other industries (secondary). Transfers of products of this industry from one establishment of a company to another establishment of the same company (interplant transfers) are also included. For further explanation, see Value of Shipments in appendixes. For meaning of abbreviations and symbols, see introductory text]

Product code	Product	1992		1987	
		Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)	Number of companies with shipments of \$100,000 or more	Value of product shipments ¹ (million dollars)
2819—	INDUSTRIAL INORGANIC CHEMICALS, N.E.C.				
	Total	(NA)	12 713.7	(NA)	10 266.1
28193	Sulfuric acid	(NA)	545.8	(NA)	557.4
28193 00	Sulfuric acid ³	45	545.8	50	557.4
28194	Inorganic acids, except nitric, sulfuric, and phosphoric	(NA)	536.8	(NA)	466.5
28194 00	Inorganic acids, except nitric, sulfuric, and phosphoric ³	50	536.8	52	466.5
28195	Aluminum oxide	(NA)	955.0	(NA)	616.6
28195 00	Aluminum oxide, except natural alumina ³	14	955.0	(NA)	616.6
28196	Other inorganic aluminum compounds	(NA)	600.8	(NA)	411.4
28196 00	Other inorganic aluminum compounds ³	46	600.8	34	411.4
28197	Inorganic potassium and sodium compounds, n.e.c.	(NA)	1 920.5	(NA)	1 407.5
28197 00	Inorganic potassium and sodium compounds, except alkalies, alums, and bleaches ³	74	1 920.5	76	1 407.5
28198	Chemical catalytic preparations	(NA)	1 352.1	(NA)	1 061.2
28198 00	Chemical catalytic preparations ³	33	1 352.1	33	1 061.2
28199	Other inorganic chemicals, n.e.c.	(NA)	6 323.1	(NA)	5 235.0
28199 00	Other inorganic chemicals, n.e.c. ³	243	6 323.1	230	5 235.0
28190	Industrial inorganic chemicals, n.e.c., n.s.k.	(NA)	479.6	(NA)	510.5
28190 00	Industrial inorganic chemicals, n.e.c., n.s.k. ⁶	(NA)	426.3	(NA)	352.0
28190 02	Industrial inorganic chemicals, n.e.c., n.s.k. ⁷	(NA)	53.3	(NA)	158.5

¹Data reported by all producers, not just those with shipments of \$100,000 or more.

²For some establishments, data have been estimated from central unit values which are based on quantity-value relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: *10 to 19 percent estimated; **20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).

³Additional detail is collected for this product code in the Current Industrial Reports. For the survey number and title, see appendix C, part 3.

⁴Typically for establishments with 10 employees or more.

⁵Typically for establishments with less than 10 employees.

⁶Typically for establishments with 15 employees or more.

⁷Typically for establishments with less than 15 employees.

⁸For 1987, data for product code 28162 55 were included with product code 28162 00.

⁹For 1992, data for product code 28163 88 are combined with 28163 98 to avoid disclosing data for individual companies.

Table 6b. Product Classes—Value of Shipments by All Producers for Specified States: 1992 and 1987

[Million dollars. Product classes shown are those where the data are geographically dispersed, provided dispersion is not approximated by data in table 2. Also, product classes are not shown if they are miscellaneous or "not specified by kind" classes. Statistics for some States are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 1992. For meaning of abbreviations and symbols, see introductory text]

Product class and geographic area	1992 value of product shipments	1987 value of product shipments	Product class and geographic area	1992 value of product shipments	1987 value of product shipments
28121, CHLORINE, COMPRESSED OR LIQUEFIED			28137, OTHER INDUSTRIAL GASES, N.E.C.		
United States	198.4	786.9	United States	812.9	704.3
Georgia	8.3	30.4	Alabama	4.8	5.0
Louisiana	64.3	270.8	California	36.7	60.5
Washington	14.7	60.8	Florida	12.1	(NA)
			Georgia	4.5	4.0
			Illinois	19.7	10.8
28123, SODIUM HYDROXIDE (CAUSTIC SODA)			Kansas	100.3	44.8
United States	2 206.6	970.2	Louisiana	175.4	110.4
Georgia	71.4	30.9	Massachusetts	4.2	(NA)
Louisiana	915.5	352.0	New York	27.8	50.7
Washington	112.6	78.3	North Carolina	8.9	5.2
			Ohio	51.7	43.6
28125, OTHER ALKALIES			Oklahoma	14.2	(NA)
United States	365.4	258.6	Pennsylvania	31.5	32.8
New York	8.8	(NA)	South Carolina	2.4	(NA)
			Texas	146.7	181.6
28132, ACETYLENE			Utah	4.4	(NA)
United States	127.0	118.4	Washington	2.9	4.1
California	6.4	5.0	West Virginia	14.4	9.7
Georgia	2.7	(NA)			
Louisiana	19.9	(NA)	28161, TITANIUM DIOXIDE		
New Jersey	2.9	2.2	United States	2 316.2	1 482.2
Ohio	5.9	6.2	28162, OTHER WHITE OPAQUE PIGMENTS		
Pennsylvania	2.5	2.3	United States	303.6	277.1
Texas	35.8	(NA)	New Jersey	4.4	(NA)
28133, CARBON DIOXIDE			28163, CHROME COLORS AND OTHER INORGANIC PIGMENTS		
United States	317.2	292.3	United States	785.0	614.2
Alabama	10.9	(NA)	California	76.2	21.8
California	34.4	28.2	Maryland	70.6	53.1
Georgia	13.4	11.6	Missouri	58.0	(NA)
Illinois	28.2	19.5	New Jersey	40.4	57.4
Iowa	15.5	10.6	Ohio	47.5	36.3
			Pennsylvania	97.8	111.5
Louisiana	15.3	13.1	28193, SULFURIC ACID		
Mississippi	16.8	(NA)	United States	545.8	557.4
Oklahoma	19.4	10.8	Arizona	30.5	21.5
Texas	19.1	29.5	Florida	11.9	16.8
Virginia	18.0	13.5	Georgia	20.8	(NA)
28135, NITROGEN			Louisiana	97.2	107.1
United States	947.0	746.6	New Jersey	14.4	26.6
Alabama	40.8	(NA)	Ohio	23.4	27.8
California	101.5	80.5	Texas	115.4	97.8
Colorado	4.8	7.7	28194, INORGANIC ACIDS, EXCEPT NITRIC, SULFURIC, AND PHOSPHORIC		
Florida	13.2	12.1	United States	536.8	466.5
Indiana	81.5	49.6	California	108.7	19.4
			Indiana	20.2	(NA)
Louisiana	37.7	35.4	Louisiana	119.5	117.0
Michigan	8.7	9.4	Michigan	8.0	(NA)
New York	24.0	30.6	Ohio	21.2	10.4
North Carolina	9.7	10.5	Texas	101.5	107.3
Ohio	72.8	42.4	28195, ALUMINUM OXIDE		
			United States	955.0	616.6
Oklahoma	20.0	10.6	Louisiana	338.1	(NA)
Pennsylvania	60.2	60.0	28196, OTHER INORGANIC ALUMINUM COMPOUNDS		
South Carolina	18.5	13.7	United States	600.8	411.4
Texas	187.6	153.3	Alabama	20.1	15.1
Washington	19.8	12.0	California	24.7	21.5
West Virginia	27.0	21.0	Florida	9.5	3.9
28136, OXYGEN			Nevada	14.9	(NA)
United States	770.6	617.3	New York	10.6	9.5
Alabama	20.1	15.1	North Carolina	3.5	3.8
California	24.7	21.5	Ohio	85.4	83.0
Florida	9.5	3.9	Pennsylvania	35.0	36.3
Nevada	14.9	(NA)	South Carolina	10.5	7.2
New York	10.6	9.5	Texas	174.1	148.6
			Utah	18.7	(NA)
North Carolina	3.5	3.8	Washington	10.9	10.6
Ohio	85.4	83.0			
Pennsylvania	35.0	36.3	28195, ALUMINUM OXIDE		
South Carolina	10.5	7.2	United States	955.0	616.6
Texas	174.1	148.6	Louisiana	338.1	(NA)
Utah	18.7	(NA)	28196, OTHER INORGANIC ALUMINUM COMPOUNDS		
Washington	10.9	10.6	United States	600.8	411.4
			Alabama	20.1	15.1
			California	24.7	21.5
			Florida	9.5	3.9
			Illinois	18.5	12.3
			Louisiana	94.3	76.9
			Maryland	16.9	(NA)
			New Jersey	40.7	21.4
			New York	23.8	(NA)
			Ohio	10.4	9.0
			South Carolina	15.0	5.5
			Texas	175.9	82.2
			Washington	3.4	7.5

See footnotes at end of table.

Table 6b. Product Classes—Value of Shipments by All Producers for Specified States: 1992 and 1987—Con.

[Million dollars. Product classes shown are those where the data are geographically dispersed, provided dispersion is not approximated by data in table 2. Also, product classes are not shown if they are miscellaneous or "not specified by kind" classes. Statistics for some States are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 1992. For meaning of abbreviations and symbols, see introductory text]

Product class and geographic area	1992 value of product shipments	1987 value of product shipments	Product class and geographic area	1992 value of product shipments	1987 value of product shipments
28197, INORGANIC POTASSIUM AND SODIUM COMPOUNDS, N.E.C.			28199, OTHER INORGANIC CHEMICALS, N.E.C.		
United States -----	1 920.5	1 407.5	United States -----	6 323.1	5 235.0
Alabama -----	42.0	34.7	Alabama -----	381.6	189.4
Florida -----	8.0	7.9	Arkansas -----	47.9	41.1
Georgia -----	80.5	95.6	California -----	125.8	159.2
Illinois -----	143.4	163.5	Colorado -----	7.7	14.3
Indiana -----	17.6	45.9	Delaware -----	50.3	(NA)
Louisiana -----	53.7	31.7	Georgia -----	63.9	66.8
Mississippi -----	127.7	55.4	Illinois -----	352.0	259.7
New Jersey -----	64.3	72.6	Indiana -----	102.3	89.9
New York -----	94.3	91.4	Kansas -----	44.6	43.8
Ohio -----	47.2	36.6	Kentucky -----	153.8	114.9
Pennsylvania -----	24.9	20.1	Louisiana -----	143.5	141.2
Texas -----	46.1	76.7	Maryland -----	76.9	59.6
Washington -----	67.6	44.8	Massachusetts -----	135.0	98.0
			Michigan -----	192.3	85.6
			Mississippi -----	90.1	62.3
			Missouri -----	83.1	69.7
			New Jersey -----	598.8	431.4
			New York -----	201.8	222.2
			North Carolina -----	450.6	251.9
			Ohio -----	286.1	214.7
			Oklahoma -----	97.6	51.5
			Pennsylvania -----	220.0	225.3
			Tennessee -----	424.9	406.9
			Texas -----	454.4	385.1
			Utah -----	5.3	(NA)
			Washington -----	71.1	10.0
			West Virginia -----	98.6	125.6
			Wisconsin -----	23.2	11.9
28198, CHEMICAL CATALYTIC PREPARATIONS					
United States -----	1 352.1	1 061.2			
California -----	193.7	(NA)			
Texas -----	131.1	70.4			

Note: For qualifications of data, see footnotes on table 6a.

Table 6c. Historical Statistics for Product Classes—Value Shipped by All Producers: 1992 and Earlier Years

[Million dollars. For meaning of abbreviations and symbols, see introductory text]

Product code	Product class	1992	1991 ¹	1990 ¹	1989 ¹	1988 ¹	1987	1982	1977
2812-	Alkalies and chlorine -----	2 789.8	3 086.7	3 206.7	3 053.8	2 666.3	2 033.5	2 346.1	1 786.7
28121	Chlorine, compressed or liquefied -----	198.4	306.0	483.5	677.2	771.3	786.9	440.8	520.0
28123	Sodium hydroxide (caustic soda) -----	2 206.6	2 369.7	2 326.3	2 006.3	1 552.0	1 584.2	1 584.2	997.0
28125	Other alkalies -----	365.4	379.5	364.2	343.4	326.3	258.6	294.0	263.0
28120	Alkalies and chlorine, n.s.k. -----	19.4	31.5	32.7	26.9	16.8	17.8	27.1	6.7
2813-	Industrial gases -----	3 115.1	3 155.8	3 013.0	2 676.7	2 730.1	2 631.0	2 002.2	1 199.1
28132	Acetylene -----	127.0	138.5	145.9	145.2	123.8	118.4	136.0	127.9
28133	Carbon dioxide -----	317.2	388.4	387.9	344.7	325.4	292.3	207.5	103.0
28135	Nitrogen -----	947.0	855.3	814.3	761.4	777.9	746.6	632.0	278.7
28136	Oxygen -----	770.6	718.7	681.1	648.6	671.5	617.3	578.3	375.1
28137	Other industrial gases, n.e.c. -----	812.9	850.0	887.4	688.6	667.1	704.3	376.5	268.0
28130	Industrial gases, n.s.k. -----	140.5	205.0	96.5	88.2	164.4	152.1	71.9	46.4
2816-	Inorganic pigments -----	3 468.2	3 056.0	3 298.8	3 185.0	2 813.7	2 425.5	1 590.7	1 339.2
28161	Titanium dioxide -----	2 316.2	1 948.0	2 131.3	2 059.6	1 674.7	1 482.2	845.8	627.1
28162	Other white opaque pigments -----	303.6	283.2	327.6	317.7	370.6	277.1	189.3	204.8
28163	Chrome colors and other inorganic pigments -----	785.0	728.3	745.0	725.1	709.5	614.2	529.3	485.0
28160	Inorganic pigments, n.s.k. -----	63.4	96.4	94.9	82.6	58.9	52.0	26.3	22.3
2819-	Industrial inorganic chemicals, n.e.c. -----	12 713.7	12 840.2	13 228.4	11 969.5	11 079.1	10 266.1	9 698.2	6 920.3
28193	Sulfuric acid -----	545.8	592.7	629.3	617.9	626.7	557.4	586.0	427.1
28194	Inorganic acids, except nitric, sulfuric, and phosphoric -----	536.8	558.0	537.4	515.3	505.4	466.5	478.6	364.4
28195	Aluminum oxide -----	955.0	1 067.9	1 433.4	1 202.4	797.8	616.6	844.2	827.3
28196	Other inorganic aluminum compounds -----	600.8	672.5	652.1	580.8	454.6	411.4	376.8	312.3
28197	Inorganic potassium and sodium compounds, n.e.c. -----	1 920.5	1 863.9	1 814.6	1 455.8	1 485.4	1 407.5	1 462.8	1 102.8
28198	Chemical catalytic preparations -----	1 352.1	1 234.2	1 224.5	1 234.7	1 090.7	1 061.2	676.5	398.4
28199	Other inorganic chemicals, n.e.c. -----	6 323.1	6 440.9	6 529.5	5 982.7	5 615.4	5 235.0	4 790.7	3 375.3
28190	Industrial inorganic chemicals, n.e.c., n.s.k. -----	479.6	410.1	407.5	380.0	503.2	510.5	482.6	112.8

¹Figures are estimates derived from a representative sample of manufacturing establishments. Standard errors associated with estimates are published in annual survey of manufactures publications for this period.

Table 7. Materials Consumed by Kind: 1992 and 1987

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

Material code	Material	1992		1987	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
INDUSTRY 2812, ALKALIES AND CHLORINE					
Materials, ingredients, containers, and supplies -----		(X)	696.7	(X)	348.4
Acids, except spent acids:					
287410	Phosphoric acid, except spent (100 percent P ₂ O ₅)----- 1,000 s tons--	-	-	-	-
281931	Sulfuric acid (100 percent H ₂ SO ₄), except spent ----- 1,000 s tons--	*85.3	5.2	49.9	3.4
281211	Chlorine (100 percent Cl) ----- 1,000 s tons--	(²)	(²)	15.2	2.4
281996	Phosphorus, elemental (technical) ----- 1,000 s tons--	-	-	-	-
281228	Sodium carbonate (soda ash) (58 percent Na ₂ O) ----- 1,000 s tons--	² 347.7	229.4	(D)	(D)
281238	Sodium hydroxide (caustic soda)(100 percent NaOH) ----- 1,000 s tons--	**17.2	1.7	34.0	3.9
289911	Salt in brine ----- 1,000 s tons--	*7 039.9	121.0	4 225.1	51.7
281002	Other industrial inorganic chemicals----- 1,000 s tons--	(X)	9.6	(X)	(³)
286003	Synthetic organic chemicals-----	(X)	(D)	(X)	(D)
Crude materials:					
109901	Bauxite ----- 1,000 s tons--	-	-	(NA)	(³)
147501	Phosphate rock ----- 1,000 s tons--	-	-	(NA)	(³)
147901	Sulfur ----- 1,000 l tons--	(D)	(⁴)	(NA)	(³)
100107	Iron and ferroalloy ores, including tungsten, chromite, manganese, molybdenum, and cobalt -----	(X)	-	(X)	(³)
100207	Nonferrous metal ores, including copper, mercury, vanadium, titanium, platinum, etc.-----	(X)	(⁴)	(X)	(³)
147007	All other crude chemical nonmetallic minerals, including barite, borate, potash, fluorspar, rock salt, etc.-----	(X)	4.2	(X)	(D)
331210	Coke including breeze, used as a raw material ----- 1,000 s tons--	-	-	-	-
Other parts, materials, and accessories:					
355911	Parts and attachments for machinery and equipment -----	(X)	(D)	(X)	40.5
265001	Paperboard containers, boxes, and corrugated paperboard-----	(X)	(D)	(X)	(D)
340001	Metal containers -----	(X)	5.3	(X)	(D)
970099	All other materials and components, parts, containers, and supplies-----	(X)	369.7	(X)	³ 179.2
971000	Materials, ingredients, containers, and supplies, n.s.k. ⁵ -----	(X)	49.8	(X)	18.0
INDUSTRY 2813, INDUSTRIAL GASES					
(Material data were not collected for this industry.)					
INDUSTRY 2816, INORGANIC PIGMENTS					
Materials, ingredients, containers, and supplies -----		(X)	1 107.0	(X)	772.3
Acids, except spent acids:					
287410	Phosphoric acid, except spent (100 percent P ₂ O ₅)----- 1,000 s tons--	(S)	1.8	(S)	.8
281931	Sulfuric acid (100 percent H ₂ SO ₄), except spent ----- 1,000 s tons--	*266.1	15.2	*257.9	13.6
281211	Chlorine (100 percent Cl) ----- 1,000 s tons--	250.3	15.6	(D)	(D)
281996	Phosphorus, elemental (technical) ----- 1,000 s tons--	(D)	(D)	-	-
281228	Sodium carbonate (soda ash) (58 percent Na ₂ O) ----- 1,000 s tons--	16.8	2.0	5.4	1.0
281238	Sodium hydroxide (caustic soda)(100 percent NaOH) ----- 1,000 s tons--	(S)	27.3	**125.1	12.4
289911	Salt in brine ----- 1,000 s tons--	(D)	(D)	(D)	(D)
281002	Other industrial inorganic chemicals----- 1,000 s tons--	(X)	102.3	(X)	(⁶)
286003	Synthetic organic chemicals-----	(X)	25.4	(X)	21.1
Crude materials:					
109901	Bauxite ----- 1,000 s tons--	-	-	-	-
147501	Phosphate rock ----- 1,000 s tons--	-	-	-	-
147901	Sulfur ----- 1,000 l tons--	(D)	(D)	(D)	(D)
100107	Iron and ferroalloy ores, including tungsten, chromite, manganese, molybdenum, and cobalt -----	(X)	40.4	(X)	(D)
100207	Nonferrous metal ores, including copper, mercury, vanadium, titanium, platinum, etc.-----	(X)	408.2	(X)	238.9
147007	All other crude chemical nonmetallic minerals, including barite, borate, potash, fluorspar, rock salt, etc.-----	(X)	9.3	(X)	28.3
331210	Coke including breeze, used as a raw material ----- 1,000 s tons--	323.0	40.1	272.9	30.2
Other parts, materials, and accessories:					
355911	Parts and attachments for machinery and equipment -----	(X)	63.2	(X)	61.4
265001	Paperboard containers, boxes, and corrugated paperboard-----	(X)	10.6	(X)	10.8
340001	Metal containers -----	(X)	2.7	(X)	.7
970099	All other materials and components, parts, containers, and supplies-----	(X)	272.4	(X)	⁶ 174.4
971000	Materials, ingredients, containers, and supplies, n.s.k. ⁵ -----	(X)	60.6	(X)	56.5
INDUSTRY 2819, INDUSTRIAL INORGANIC CHEMICALS, N.E.C.					
Materials, ingredients, containers, and supplies -----		(X)	5 018.1	(X)	3 827.1
Acids, except spent acids:					
287410	Phosphoric acid, except spent (100 percent P ₂ O ₅)----- 1,000 s tons--	412.8	148.7	260.1	77.2
281931	Sulfuric acid (100 percent H ₂ SO ₄), except spent ----- 1,000 s tons--	2 357.5	86.6	1 343.8	74.0
281211	Chlorine (100 percent Cl) ----- 1,000 s tons--	*178.4	9.1	142.4	20.1
281996	Phosphorus, elemental (technical) ----- 1,000 s tons--	117.1	216.9	257.1	282.4
281228	Sodium carbonate (soda ash) (58 percent Na ₂ O) ----- 1,000 s tons--	977.8	91.4	582.6	70.9
281238	Sodium hydroxide (caustic soda)(100 percent NaOH) ----- 1,000 s tons--	884.9	188.9	768.9	76.7
289911	Salt in brine ----- 1,000 s tons--	*227.1	4.7	*568.2	11.0
281002	Other industrial inorganic chemicals----- 1,000 s tons--	(X)	553.6	(X)	(⁶)
286003	Synthetic organic chemicals-----	(X)	192.4	(X)	107.0

See footnotes at end of table.

Table 7. Materials Consumed by Kind: 1992 and 1987—Con.

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. For further explanation, see Cost of Materials in appendixes. For meaning of abbreviations and symbols, see introductory text]

Material code	Material	1992		1987	
		Quantity ¹	Delivered cost (million dollars)	Quantity ¹	Delivered cost (million dollars)
INDUSTRY 2819, INDUSTRIAL INORGANIC CHEMICALS, N.E.C.—Con.					
Crude materials:					
109901	Bauxite ----- 1,000 s tons--	11 265.7	348.3	8 443.5	282.5
147501	Phosphate rock ----- 1,000 s tons--	(D)	(D)	**3 157.8	57.7
147901	Sulfur ----- 1,000 l tons--	1 164.7	65.9	1 006.5	114.0
100107	Iron and ferroalloy ores, including tungsten, chromite, manganese, molybdenum, and cobalt -----	(X)	68.8	(X)	55.1
100207	Nonferrous metal ores, including copper, mercury, vanadium, titanium, platinum, etc.-----	(X)	227.5	(X)	187.2
147007	All other crude chemical nonmetallic minerals, including barite, borate, potash, fluorspar, rock salt, etc.-----	(X)	112.1	(X)	43.8
331210	Coke including breeze, used as a raw material ----- 1,000 s tons--	(D)	(D)	*473.3	50.0
Other parts, materials, and accessories:					
355911	Parts and attachments for machinery and equipment -----	(X)	145.7	(X)	106.3
265001	Paperboard containers, boxes, and corrugated paperboard -----	(X)	37.6	(X)	39.3
340001	Metal containers -----	(X)	23.1	(X)	26.1
970099	All other materials and components, parts, containers, and supplies -----	(X)	1 690.9	(X)	⁶¹ 578.9
971000	Materials, ingredients, containers, and supplies, n.s.k. ⁵ -----	(X)	748.7	(X)	567.0

¹For some establishments, data have been estimated from central unit values which are based on quantity-value relationships of reported data. The following symbols are used when percentage of each quantity figure estimated in this manner equals or exceeds 10 percent of published figure: *10 to 19 percent estimated; **20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by (S).

²For 1992, data for material code 281211 are included with material code 281228 to avoid disclosing data for individual companies.

³For 1987, data for material codes 281002, 109901, 147501, 147901, 100107, and 100207 were included with material code 970099.

⁴For 1992, data for material codes 147901 and 100207 are combined with material code 147007 to avoid disclosing data for individual companies.

⁵Total cost of materials of establishments that did not report detailed materials data, including establishments that were not mailed a form.

⁶For 1987, data for material code 281002 were included with material code 970099.

Table 8. Statistics for Privately Owned and Operated Establishments: 1992 and 1987

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

Year	Companies (number)	All establishments		All employees		Production workers			Value added by manufacture ¹ (million dollars)	Cost of materials (million dollars)	Value of shipments (million dollars)	Expenditures and assets		End-of-year inventories	Ratios	
		Total (number)	With 20 employees or more (number)	Number (1,000)	Payroll (million dollars)	Number (1,000)	Hours (millions)	Wages (million dollars)				New capital expenditures (million dollars)	Gross value of fixed assets (million dollars)		Specialization (percent)	Coverage (percent)
INDUSTRY 2819, INDUSTRIAL INORGANIC CHEMICALS, N.E.C. (TOTAL)¹																
1992 ---	446	697	327	79.1	3 270.5	39.8	87.5	1 424.5	²¹¹ 208.2	³⁶ 962.9	⁴¹⁸ 164.1	^{5722.5}	⁵¹⁰ 388.5	⁵¹ 633.2	⁵⁹¹	⁶⁸²
1987 ---	428	662	308	72.2	2 425.2	37.5	76.2	1 138.9	²⁷ 529.5	³⁵ 639.5	⁴¹³ 211.6	^{5506.1}	⁵⁶ 956.3	⁵¹ 306.1	⁵⁹¹	⁶⁸⁰
INDUSTRY 2819, INDUSTRIAL INORGANIC CHEMICALS, N.E.C. (PRIVATELY OWNED AND OPERATED ESTABLISHMENTS)																
1992 ---	443	689	319	40.0	1 559.3	24.1	52.3	842.0	⁵ 950.2	⁶ 269.0	¹² 217.2	^{722.5}	¹⁰ 388.5	¹ 633.2	⁹¹	⁸²
1987 ---	424	654	300	38.3	1 206.3	23.3	48.6	672.9	⁴ 559.5	⁴ 824.1	⁹ 426.2	^{506.1}	⁶ 956.3	¹ 306.1	⁹¹	⁸⁰

¹Includes both privately owned and operated plants and government-owned, contractor-operated plants.

²Data include value added for government-owned, contractor-operated plants which were estimated based on averages reported for commercial establishments in prior years.

³Data exclude government-owned materials furnished to government-owned, contractor-operated plants and include fuels and electric energy purchased by or for these plants.

⁴Data include a calculated value of shipments for government-owned, contractor-operated plants comprised of adjusted value added (estimated as described in footnote 2) plus cost of fuels and electric energy.

⁵Total excludes expenditures, inventories, and fixed assets of government-owned, contractor-operated plants.

⁶Government-owned, contractor-operated establishments did not enter into calculation of primary product specialization ratio or coverage ratio; all dollar receipts for these establishments were included in miscellaneous receipts.

Table 9. Employees Engaged in Construction and Value of Work Done: 1992

[For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

SIC code	Industry	Total		Establishments reporting construction employees ¹					Response coverage ratio (col C ÷ col A)
		Employees (1,000)	Payroll (million dollars)	Total		Engaged in construction ²		Value of work done (millions)	
				Employees (1,000)	Payroll (million dollars)	Employees (1,000)	Payroll (million dollars)		
A	B	C	D	E	F	G	H		
2819	Industrial inorganic chemicals, n.e.c.-----	79.1	3 270.5	7.4	293.4	1.2	49.7	122.6	.09

¹Data exclude government-owned, contractor-operated plants.

²Establishments in selected industries were instructed to report number of employees, included in total employment, that were engaged in construction, maintenance, or repair of the plant and utilized as a separate work force. Coverage ratio (col. H) indicates proportion of industry employment represented by establishments that reported construction employees. Coverage ratio excludes (a) construction workers not employed by establishment (working under contract or provided by another establishment of the company), (b) establishments that reported having no construction employees, (c) establishments that did not respond to inquiry, and (d) establishments that were not mailed a form or from which a form had not been received at the time data were tabulated.

Appendix A. Explanation of Terms

This appendix is in two sections. Section 1 includes items requested of all establishments mailed census of manufactures forms including annual survey of manufactures (ASM) forms. Note that this section also includes several items (number of establishments and companies, value added, classes of products, and specialization and coverage ratios) not included on the report forms but derived from information collected on the forms. Section 2 covers supplementary items requested only from establishments included in the ASM sample. Results of the supplementary ASM inquiries are included in table 3c of this report.

SECTION 1. ITEMS COLLECTED OR DERIVED BASED ON ALL CENSUS OF MANUFACTURES (INCLUDING ASM) REPORT FORMS

Number of establishments and companies. A separate report was required for each manufacturing establishment (plant) with one employee or more. An establishment is defined as a single physical location where manufacturing is performed. A company, on the other hand, is defined as a business organization consisting of one establishment or more under common ownership or control.

If the company operated at different physical locations, even if the individual locations were producing the same line of goods, a separate report was requested for each location. If the company operated in two or more distinct lines of manufacturing at the same location, a separate report was requested for each activity.

An establishment not in operation for any portion of the year was requested to return the report form with the proper notation in the "Operational Status" section of the form. In addition, the establishment was requested to report data on any employees, capital expenditures, inventories, or shipments from inventories during the year.

In this report, data are shown for establishments in operation at any time during the year. A comparison with the number of establishments in operation at the end of the year will be provided in the Introduction of the *General Summary* subject report.

Employment and related items. The report forms requested separate information on production workers for a specific payroll period within each quarter of the year and on other employees as of the payroll period which included the 12th of March.

All employees. This item includes all full-time and part-time employees on the payrolls of operating manufacturing establishments during any part of the pay period which included the 12th of the months specified on the report form. Included are all persons on paid sick leave,

paid holidays, and paid vacations during these pay periods. Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employees" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average for the payroll periods including the 12th of March, May, August, and November.

Production workers. This item includes workers (up through the line-supervisor level) engaged in fabricating, processing, assembling, inspecting, receiving, storing, handling, packing, warehousing, shipping (but not delivering), maintenance, repair, janitorial and guard services, product development, auxiliary production for plant's own use (e.g., power plant), recordkeeping, and other services closely associated with these production operations at the establishment covered by the report. Employees above the working-supervisor level are excluded from this item.

All other employees. This item covers nonproduction employees of the manufacturing establishment including those engaged in factory supervision above the line-supervisor level. It includes sales (including driver salespersons), sales delivery (highway truckdrivers and their helpers), advertising, credit, collection, installation and servicing of own products, clerical and routine office function, executive, purchasing, financing, legal, personnel (including cafeteria, medical, etc.), professional, and technical employees. Also included are employees on the payroll of the manufacturing establishment engaged in the construction of major additions or alterations to the plant and utilized as a separate work force.

In addition to reports sent to operating manufacturing establishments, information on employment during the payroll period which included March 12 and annual payrolls also was requested of auxiliary units (e.g., administrative offices, warehouses, and research and development

laboratories) of multiestablishment companies. However, these figures are not included in the totals for individual industries shown in this report. They are included in the *General Summary* and geographic area reports as a separate category.

Payroll. This item includes the gross earnings of all employees on the payrolls of operating manufacturing establishments paid in the calendar year 1992. Respondents were told they could follow the definition of payrolls used for calculating the Federal withholding tax. It includes all forms of compensation, such as salaries, wages, commissions, dismissal pay, bonuses, vacation and sick leave pay, and compensation in kind, prior to such deductions as employees' Social Security contributions, withholding taxes, group insurance, union dues, and savings bonds. The total includes salaries of officers of corporations; it excludes payments to proprietors or partners of unincorporated concerns. Also excluded are payments to members of Armed Forces and pensioners carried on the active payrolls of manufacturing establishments.

The census definition of payrolls is identical to that recommended to all Federal statistical agencies by the Office of Management and Budget. It should be noted that this definition does not include employers' Social Security contributions or other nonpayroll labor costs, such as employees' pension plans, group insurance premiums, and workers' compensation.

The ASM provides estimates of employers' supplemental labor costs, both those required by Federal and State laws and those incurred voluntarily or as part of collective bargaining agreements. (Supplemental labor costs are explained later in this appendix.)

As in the case of employment figures, the payrolls of separate auxiliary units of multiestablishment companies are not included in the totals for individual industries or industry groups.

Production-worker hours. This item covers hours worked or paid for at the plant, including actual overtime hours (not straight-time equivalent hours). It excludes hours paid for vacations, holidays, or sick leave.

Cost of materials. This term refers to direct charges actually paid or payable for items consumed or put into production during the year, including freight charges and other direct charges incurred by the establishment in acquiring these materials. It includes the cost of materials or fuel consumed, whether purchased by the individual establishment from other companies, transferred to it from other establishments of the same company, or withdrawn from inventory during the year.

The important components of this cost item are (1) all raw materials, semifinished goods, parts, containers, scrap, and supplies put into production or used as operating supplies and for repair and maintenance during the year, (2) electric energy purchased, (3) fuels consumed for heat, power, or the generation of electricity, (4) work done by

others on materials or parts furnished by manufacturing establishments (contract work), and (5) products bought and resold in the same condition. (See discussion of duplication of data below.)

Specific materials consumed. In addition to the total cost of materials, which every establishment was required to report, information also was collected for most manufacturing industries on the consumption of major materials used in manufacturing. The inquiries were restricted to those materials which were important parts of the cost of production in a particular industry and for which cost information was available from manufacturers' records. Information on the establishments consuming less than a specified amount (usually \$25,000) of a specific material were not requested to report consumption of that material separately. Also, the cost of materials for the small establishments for which either administrative records or short forms were used was imputed as "not specified by kind." (See Census of Manufactures for the importance of administrative records in the industry.)

Value of shipments. This item covers the received or receivable net selling values, f.o.b. plant (exclusive of freight and taxes), of all products shipped, both primary and secondary, as well as all miscellaneous receipts, such as receipts for contract work performed for others, installation and repair, sales of scrap, and sales of products bought and resold without further processing. Included are all items made by or for the establishments from materials owned by it, whether sold, transferred to other plants of the same company, or shipped on consignment. The net selling value of products made in one plant on a contract basis from materials owned by another was reported by the plant providing the materials.

In the case of multiunit companies, the manufacturer was requested to report the value of products transferred to other establishments of the same company at full economic or commercial value, including not only the direct cost of production but also a reasonable proportion of "all other costs" (including company overhead) and profit. (See discussion of duplication of data below.)

Individual products. As in previous censuses, data were collected for most industries on the quantity and value of individual products shipped. In the 1992 census program, information was collected on the output of almost 11,000 individual product items. The term "product," as used in the census of manufactures, represents the finest level of detail for which output information was requested. Consequently, it is not necessarily synonymous with the term "product" as used in the marketing sense. In some cases, it may be much more detailed and, in other cases, it is more aggregative. For example, "pharmaceutical preparations" was distributed into over 100 terms; whereas, "motor gasoline" was reported as a single item.

Approximately 6,300 of the product items were listed separately on the 1992 census report forms. Data for

about 4,500 products were obtained in the monthly, quarterly, or annual surveys comprising the Current Industrial Reports series of the Census Bureau. Totals for the year 1992 for these items, as derived from the commodity surveys, are shown in the "products shipped" table.

The list of products for which separate information was collected was prepared after consultation with industry and government representatives. Comparability with previous figures was given considerable weight in the selection of product categories so that comparable 1987 information is presented for most products.

Typically, both quantity and value of shipments information were collected. However, if quantity was not significant or could not be reported by manufacturers, only value of shipments was collected.

Shipments include both commercial shipments and transfers of products to other plants of the same company. For industries in which a considerable portion of the total shipments is transferred to other plants of the same company, separate information on interplant transfers also was collected. Moreover, for products that are used to a large degree within the same establishment as materials or components in the fabrication of other products, total production and often consumption of the item within the plant was collected. Typically, the information on production also was collected for products for which there are significant differences between total production and shipments in a given year because of wide fluctuations in finished goods inventories. Other measures of output of products with long production cycles were used as appropriate and feasible.

Classes of products. To summarize the product information, the separate products were aggregated into classes of products that, in turn, were grouped into all primary products of each industry. The code structure used is a seven-digit number for the individual product, a five-digit number for the class of product, and a four-digit number for the total primary products in an industry. (See Census of Manufactures, Industry Classification of Establishments, for application of the coding structure to the assignment of SIC codes for establishments.)

In the 1992 census, the 11,000 products were grouped into approximately 1,500 separate classes on the basis of general similarity of manufacturing processes, types of materials used, etc. However, the grouping of products was affected by the economic significance of the class and, in some cases, dissimilar products were grouped because the products were not sufficiently significant to warrant separate classes.

Duplication in cost of materials and value of shipments. The aggregate of the cost of materials and value of shipments figures for industry groups and for all manufacturing industries includes large amounts of duplication since the products of some industries are used as materials by others. This duplication results, in part, from the addition of related industries representing successive stages

in the production of a finished manufactured product. Examples are the addition of flour mills to bakeries in the food group and the addition of pulp mills to paper mills in the paper and allied products group of industries. Estimates of the overall extent of this duplication indicate that the value of manufactured products exclusive of such duplication (the value of finished manufactures) tends to approximate two-thirds of the total value of products reported in the annual survey.

Duplication of products within individual industries is significant within a number of industry groups, e.g., machinery and transportation industries. These industries frequently include complete machinery and their parts. In this case, the parts made for original equipment are materials consumed for assembly plants in the same industry.

Even when no significant amount of duplication is involved, value of shipments figures are deficient as measures of the relative economic importance of individual manufacturing industries or geographic areas because of the wide variation in ratio of materials, labor, and other processing costs of value of shipments, both among industries and within the same industry.

Before 1962, cost of materials and value of shipments were not published for some industries which included considerable duplication. Since then, these data have been published for all industries at the U.S. level and beginning in 1964, for all geographic levels.

Value added by manufacture. This measure of manufacturing activity is derived by subtracting the cost of materials, supplies, containers, fuel, purchased electricity, and contract work from the value of shipments (products manufactured plus receipts for services rendered). The result of this calculation is adjusted by the addition of value added by merchandising operations (i.e., the difference between the sales value and the cost of merchandise sold without further manufacture, processing, or assembly) plus the net change in finished goods and work-in-process between the beginning- and end-of-year inventories.

For those industries where value of production is collected instead of value of shipments (see footnote in table 1a), value added is adjusted only for the change in work-in-process inventories between the beginning and end of year. For those industries where value of work done is collected, the value added does not include an adjustment for the change in finished goods or work-in-process inventories.

"Value added" avoids the duplication in the figure for value of shipments that results from the use of products of some establishments as materials by others. Value added is considered to be the best value measure available for comparing the relative economic importance of manufacturing among industries and geographic areas.

New and used capital expenditures. For establishments in operation and any known plants under construction, manufacturers were asked to report their new expenditures for (1) permanent additions and major alterations to

manufacturing establishments, and (2) machinery and equipment used for replacement and additions to plant capacity if they were of the type for which depreciation accounts were ordinarily maintained.

The totals for new expenditures include expenditures leased from nonmanufacturing concerns through capital leases. New facilities owned by the Federal Government but operated under contract by private companies, and plant and equipment furnished to the manufacturer by communities and nonprofit organizations are excluded. Also excluded are expenditures for used plant and equipment (although reported in the census), expenditures for land, and cost of maintenance and repairs charged as current operating expenses.

Manufacturers also were requested to report the value of all used buildings and equipment purchased during the year at the purchase price. For any equipment or structure transferred for the use of the reporting establishment by the parent company or one of its subsidiaries, the value at which it was transferred to the establishment was to be reported. Furthermore, if the establishment changed ownership during the year, the cost of the fixed assets (building and equipment) was to be reported under used capital expenditures.

Total expenditures for used plant and equipment is a universe figure; it is collected on all census forms. However, the breakdown of this figure between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form. The data for total new capital expenditures, new building expenditures, and new machinery expenditures, as well as the data for total used expenditures, are shown in table 3b.

End-of-year inventories. Respondents were asked to report their 1991 and 1992 end-of-year inventories at cost or market. Effective with the 1982 Economic Census, this change to a uniform instruction for reporting inventories was introduced for all sector reports. Prior to 1982, respondents were permitted to value inventories using any generally accepted accounting method (FIFO, LIFO, market, to name a few). In 1982, LIFO users were asked to first report inventory values prior to the LIFO adjustment and then to report the LIFO reserve and the LIFO value after adjustment for the reserve.

SECTION 2. ITEMS COLLECTED ONLY ON ASM REPORT FORMS

The following items were collected only from establishments included in the ASM sample:

Supplemental labor costs. Supplemental labor costs are divided into legally required expenditures and payments for voluntary programs. The legally required portion consists primarily of Federal old age and survivors' insurance, unemployment compensation, and workers' compensation. Payments for voluntary programs include all programs not specifically required by legislation whether they

Because of this change in reporting instructions, the 1982 through 1992 data for inventories and value added by manufacture included in the tables of this report are not comparable to the prior-year data shown in table 1a of this report and in historical census of manufactures and annual survey of manufactures publications.

In using inventory data by stage of fabrication for "all industries" and at the two-digit industry level, it should be noted that an item treated as a finished product by an establishment in one industry may be reported as a raw material by another establishment in a different industry. For example, the finished-product inventories of a steel mill would be reported as raw materials by a stamping plant. Such differences are present in the inventory figures by stage of fabrication shown for individual industries, industry groups, and "all manufacturing", which are aggregates of figures reported by establishments in specified industries.

Specialization and coverage ratios. These items are not collected on the report forms but are derived from the data shown in table 5b. An establishment is classified in a particular industry if its shipments of primary products of that industry exceed in value its shipments of the products of any other single industry.

An establishment's shipments include those products assigned to an industry (primary products), those considered primary to other industries (secondary products), and receipts for miscellaneous activities (merchandising, contract work, resales, etc.). Specialization and coverage ratios have been developed to measure the relationship of primary product shipments to the data on shipments for the industry shown in tables 1a through 5a and data on product shipments shown in tables 6a through 6c.

Specialization ratio represents the ratio of primary product shipments to total product shipments (primary and secondary, excluding miscellaneous receipts) for the establishments classified in the industry.

Coverage ratio represents the ratio of primary products shipped by the establishments classified in the industry to the total shipments of such products that are shipped by all manufacturing establishments wherever classified.

were employer initiated or the result of collective bargaining. They include the employer portion of such plans as insurance premiums, premiums for supplemental accident and sickness insurance, pension plans, supplemental unemployment compensation, welfare plans, stock purchase plans on which the employer payment is not subject to withholding tax, and deferred profit-sharing plans. They exclude such items as company-operated cafeterias, in-plant medical services, free parking lots, discounts on employee purchases, and uniforms and work clothing for employees.

While the excluded items do benefit employees and all or part of their cost generally is similar to the items covered in the ASM labor costs statistics, accounting records generally do not provide reliable figures on net employee benefits of these types.

Retirements of depreciable assets. Included in this item is the gross value of assets sold, retired, scrapped, destroyed, etc., during 1992. When a complete operation or establishment changed ownership, the respondent was instructed to report the value of the assets sold at the original cost as recorded in the books of the seller. The respondent also was requested to report retirements of equipment or structures owned by a parent company that the establishment was using as if it were a tenant.

Depreciation charges for fixed assets. This item includes depreciation and amortization charged during the year against assets. Depreciation charged against fixed assets acquired since the beginning of the year and against assets sold or retired during the year are components of this category. Respondents were requested to make certain that they did not report accumulated depreciation.

Rental payments. Total rental payments is collected on all census forms. However, the breakdown between rental payments for buildings and other structures and rental payments for machinery and equipment is collected only on the ASM forms. This item includes rental payments for the use of all items for which depreciation reserves would be maintained if they were owned by the establishment, e.g., structures and buildings, and production, office, and transportation equipment. Excluded are royalties and other payments for the use of intangibles and depletable assets, and land rents where separable.

When an establishment of a multiestablishment company was charged rent by another part of the same company for the use of assets owned by the company, it was instructed to exclude that cost from rental payments. However, the book value (original cost) of these company-owned assets was to be reported as assets of the establishment at the end of the year.

If there were assets at an establishment rented from another company and the rents were paid centrally by the head office of the establishment, the company was instructed to report these rental payments as if they were paid directly by the establishment.

Depreciable assets. Total value of gross depreciable assets is collected on all census forms. However, the detail for depreciable assets is collected only on the ASM forms. The data encompass all fixed depreciable assets on the books of establishments at the beginning and end of the year. The values shown (book value) represent the actual cost of assets at the time they were acquired, including all costs incurred in making the assets usable (such as transportation and installation). Included are all

buildings, structures, machinery, and equipment (production, office, and transportation equipment) for which depreciation reserves are maintained. Excluded are nondepreciable capital assets, including inventories and intangible assets, such as timber and mineral rights.

The definition of fixed depreciable assets is consistent with the definition of capital expenditures. For example, expenditures include actual capital outlays during the year, rather than the final value of equipment put in place and buildings completed during the year. Accordingly, the value of assets at the end of the year includes the value of construction in progress. In addition, respondents were requested to make certain that assets at the beginning of the year plus new and used capital expenditures, less retirements, equalled assets at the end of the year.

New and used capital expenditures. The data for total new capital expenditures, new building expenditures, new machinery expenditures, and total used capital expenditures are collected on all census forms. However, the breakdown between expenditures for used buildings and other structures and expenditures for used machinery and equipment is collected only on the ASM form. (See further explanation on capital expenditures in section 1.)

Quantity of electric energy consumed for heat and power. Data on the cost of purchased electric energy are collected on all census forms. However, data on the quantity of purchased electric energy are collected only on the ASM forms. In addition, information is collected on the quantity of electric energy generated by the establishment and the quantity of electric energy sold or transferred to other plants of the same company.

Breakdown of new capital expenditures for machinery and equipment. ASM establishments were requested to separate their capital expenditures for new machinery and equipment into (1) automobiles, trucks, etc., for highway use, (2) computers and peripheral data processing equipment, and (3) all other.

The category "automobiles, trucks, etc., for highway use" is intended to measure expenditures for vehicles designed for highway use that were acquired through a purchase or lease-purchase agreement. Vehicles normally operating off public highways (vehicles specifically designed to transport materials, property, or equipment on mining, construction, logging, and petroleum development projects) are excluded from this item.

Foreign content of cost of materials. Establishments included in the ASM sample panel were requested to provide information on foreign-made materials purchased or transferred from foreign sources. This includes materials acquired from a central warehouse or other domestic establishment of the same company but made in an operation outside of the 50 States, District of Columbia, Puerto Rico, or U.S. territories.

Cost of purchased services. ASM establishments were requested to provide information on the cost of purchased services for the repair of buildings and other structures, the repair of machinery, communication services, legal services, accounting and bookkeeping services, advertising, software and other data processing services, and refuse removal. Each of these items reflect the costs paid directly by the establishment, and exclude salaries paid to employees of the establishment for these services.

Included in the cost of purchased services for the repair of buildings and machinery are payments made for all maintenance and repair work on buildings and equipment, such as painting, roof repairs, replacing parts, and overhauling equipment. Such payments made to other establishments of the same company and for repair and maintenance of any leased property also are included. Extensive repairs or reconstruction that were capitalized are considered capital expenditures for used buildings and machinery and are, therefore, excluded from this item. Repair and maintenance costs provided by an owner as part of a rental contract or incurred directly by an establishment in using its own work force also are excluded.

Included in the cost of purchased advertising services are payments for printing, media coverage, and other advertising services and materials.

Included in the cost of purchased software and other data processing services are all purchases by the establishment from other companies. Excluded are services provided by other establishments of the same company (such as by a separate data processing unit).

Included in the cost of purchased refuse removal services are all costs of refuse removal services paid by the establishment, including costs for hazardous waste removal or treatment. Excluded are all costs included in rental payments or as capital expenditures.

Three basic approaches were utilized to produce these statistics.

1. For items 1 through 6, data were estimated (imputed) for all non-ASM establishments using the available data in the establishment record and industry-based parameters. The statistics were then generated by simply tabulating all census records including the imputed value for non-ASM establishments and the unweighted value for ASM establishments. Separate imputation rates were developed and are shown in the table. For quantity of purchased electricity for heat and power (item 7), a similar procedure was used; however, the imputation parameters were geographically-based instead of industry-based. For quantities of generated less sold electricity, no imputation was performed for non-ASM establishments. The estimates for these items are simply tabulations of unweighted ASM values.

Since the published statistics for these items were developed from the complete census universe and not just the ASM establishments, there are no sampling variances associated with these statistics. However, there is an unknown level of bias for each of the items due to the imputation of the non-ASM establishments. This bias is felt to be small due to the strong correlation between the items being imputed and the collected items that were used to generate the impute values.

2. For items 8 and 9, the estimates were developed using a ratio estimation methodology. For item 8, an estimate of the breakout of new capital expenditures for machinery and equipment into the three categories was made from ASM establishments reporting these categories. The estimated proportions were then applied to the corresponding census value for new capital expenditures for machinery and equipment to produce the estimates.

The estimates for item 9, foreign content of cost of materials, were developed in a similar manner based on costs of parts, supplies, and components (item 5a) as the control total for the three categories.

For items 8 and 9, an adjustment ratio of the following form was computed:

$$R_j = \frac{NMc}{TMEasm}$$

where:

NMc = the census value of new capital expenditures for machinery and equipment

TMEasm = the weighted ASM value of new capital expenditures for machinery and equipment from reporters of the detailed breakout data

3. For item 10, cost of purchased services, the estimates were made by simply tabulating weighted data for all the ASM records that reported the item. A response coverage ratio (a measure of the extent to which respondents reported for each item) is shown in table 3c for the types of services. It is derived for each item by calculating the ratio of the weighted employment (establishment data multiplied by sample weight, see appendix B) for those ASM establishments that reported the specific inquiry to the weighted total employment for all ASM establishments classified in the industry.

Appendix B.

Annual Survey of Manufactures Sampling and Estimating Methodologies

DESCRIPTION OF SURVEY SAMPLE

The annual survey of manufactures (ASM) contains two components. The mail portion of the survey is a probability sample of about 64,000 manufacturing establishments selected from a total of about 216,000 establishments. These 216,000 establishments represent all manufacturing establishments of multiunit companies and all single-establishment companies mailed schedules in the 1987 Census of Manufactures. This mail portion is supplemented annually by a Social Security Administration list of new manufacturing establishments opened after 1987 and a list of new multiunit manufacturing establishments identified from the Census Bureau's Company Organization Survey.

For the current panel, all establishments of companies with 1987 shipments in manufacturing in excess of \$500 million were included in the survey panel with certainty. There are approximately 500 such companies collectively accounting for approximately 18,000 establishments. For the remaining portion of the mail survey, the establishment was defined as the sampling unit. For this portion, all establishments with 250 employees or more and establishments with a very large value of shipments also were included in the survey panel with certainty. A total of 12,100 establishments were selected from this portion of the universe with certainty. Therefore, of the 64,000 manufacturing establishments included in the ASM panel, approximately 31,000 are selected with certainty. These certainty establishments collectively account for approximately 80 percent of the total value of shipments in the 1987 census.

Smaller establishments in the remaining portion of the mail survey were sampled with probabilities ranging from 0.999 to 0.005 in accordance with mathematical theory for optimum allocation of a sample. The probabilities of selection assigned to the smaller establishments were proportional to measures of size determined for each establishment. The measures of size depend directly upon each establishment's 1987 product class values and the historic variability of the year-to-year shipments of each product class. Product classes displaying more volatile year-to-year change in shipments at the establishment level were sampled at a heavier rate.

This method of assigning measures of size was used in order to maximize the precision (that is, minimize the variance of estimates of the year-to-year change) in the value of product class shipments. Implicitly, it also gave weight differences in employment, value added, and other

general statistics, since these are highly correlated with value of shipments. Individual sample selection probabilities were obtained by multiplying each establishment's final measure of size by an overall sampling fraction coefficient calculated to yield a total expected sample size.

The sample selection procedure gave each establishment in the sampling frame an independent chance of selection. This method of independent selection permits the rotation of small establishments out of a given sample panel without introducing a bias into the survey estimates.

The nonmail portion of the survey includes all single-establishment companies that were tabulated as administrative records in the 1987 Census of Manufactures. Although this portion contained approximately 134,000 establishments, it accounted for less than 2 percent of the estimate for total value of shipments at the total manufacturing level. This portion was not sampled; rather, the data for every establishment in this group were estimated based on selected information obtained annually from the administrative records of the Internal Revenue Service and the Social Security Administration. This administrative-records information, which includes payroll, total employment, industry classification, and physical location of the establishment, was obtained under conditions which safeguard the confidentiality of both tax and census records. Estimates of data other than payroll and employment for these small establishments were developed from industry averages.

The corresponding estimates for the mail and nonmail establishments were added together, along with the base-year differences, as defined in the Description of Estimating Procedure section, to produce the figures shown in this publication.

DESCRIPTION OF ESTIMATING PROCEDURES

Most of the ASM estimates for the years 1988-1991 were computed using a difference estimation procedure. For each item, a base-year difference was developed. This base-year difference is equal to the difference between the 1987 census published number for an item total and the linear ASM estimate of the total for 1987. The ASM linear estimate was obtained by multiplying each sample establishment's data by its sample weight (the reciprocal of its probability of selection) and summing the weighted values.

These base-year differences were then added to the corresponding current-year linear estimates, which include the sum of the estimates for the mail and nonmail

establishments, to produce the estimates for the years 1983-1991. Estimates developed by this procedure usually are far more reliable than comparable linear estimates developed from the current sample data alone.

However, the 1992 sample estimates for the purchased service items, shown in table 3c, are strictly ASM linear estimates developed only from ASM establishments that reported the specific item.

The remaining estimates in table 3c, showing the breakdown of expenditures for new machinery and equipment and costs of parts (separated into purchases from foreign sources and purchases from domestic sources), were computed as ratio estimates. To do this, linear estimates of the new machinery detail items were developed from the ASM establishments and were ratio adjusted to the corresponding census total for new machinery. In a similar fashion, the ASM linear estimates of the detailed purchased materials items were ratio adjusted to the corresponding census total for cost of parts.

QUALIFICATIONS OF THE DATA

The estimates developed from the sample are apt to differ somewhat from the results of a survey covering all companies in the sampled lists but otherwise conducted under essentially the same conditions as the actual sample survey. The estimates of the magnitude of the sampling errors (the differences between the estimates obtained and the results theoretically obtained from a comparable, complete-coverage survey) are provided by the standard errors of the estimates.

The particular sample selected for the ASM is one of a large number of similar probability samples that, by chance, might have been selected under the same specifications. Each of the possible samples would yield somewhat different sets of results, and the standard errors are measures of the variation of all the possible sample estimates around the theoretical, comparable, complete-coverage values.

Estimates of the standard errors have been computed from the sample data for selected statistics in this report. They are presented in the form of relative standard errors (the standard errors divided by the estimated values to which they refer).

In conjunction with its associated estimate, the relative standard error may be used to define confidence intervals (ranges that would include the comparable, complete-coverage value for specified percentages of all the possible samples).

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 about two-thirds of all possible samples.
2. From two standard errors below to two standard errors above the derived estimate for about 19 of 20 of all possible samples.
3. From three standard errors below to three standard errors above the derived estimate for nearly all samples.

An inference that the comparable, complete-survey result would be within the indicated ranges would be correct in approximately the relative frequencies shown. Those proportions, therefore, may be interpreted as defining the confidence that the estimates from a particular sample would differ from complete-coverage results by as much as one, two, or three standard errors, respectively.

For example, suppose an estimated total is shown as 50,000 with an associated relative standard error of 2 percent, that is, a standard error of 1,000 (2 percent of 50,000). There is approximately 67 percent confidence that the interval 49,000 to 51,000 includes the complete-coverage total, about 95 percent confidence that the interval 48,000 to 52,000 includes the complete-coverage total and almost certain confidence that the interval 47,000 to 53,000 includes the complete-coverage total.

In addition to the sample errors, the estimates are subject to various response and operational errors: errors of collection, reporting, coding, transcription, imputation for nonresponse, etc. These operational errors also would occur if a complete canvass were to be conducted under the same conditions as the survey. Explicit measures of their effects generally are not available. However, it is believed that most of the important operational errors were detected and corrected in the course of the Census Bureau's review of the data for reasonableness and consistency. The small operational errors usually remain. To some extent, they are compensating in the aggregated totals shown. When important operational errors were detected too late to correct the estimates, the data were suppressed or were specifically qualified in the tables.

As derived, the estimated standard errors included part of the effect of the operational errors. The total errors, which depend upon the joint effect of the sampling and operational errors, are usually of the order of size indicated by the standard error, or only moderately higher. However, for particular estimates, the total error may considerably exceed the standard errors shown.

The concept of complete coverage under the conditions prevailing for the ASM is not identical to the complete coverage of the census of manufactures, as the censuses have been conducted. Nearly all types of operational errors that affect the ASM also occur in the censuses. The ASM and the censuses, are conducted under quite different conditions, and operational errors can be better controlled in the ASM than in the censuses. As a result, for many of the census figures, the errors are of the same order of size as the total errors of the corresponding annual survey estimates. The differences between the census and ASM operating conditions also disturb, to some degree, the comparability of the ASM and census data.

Any figures shown in the tables in this publication having an associated standard error exceeding 15 percent may be of limited reliability. However, the figure may be combined with higher-level totals, creating a broader aggregate, which then may be of acceptable reliability.

Appendix C. Product Code Reference Tables

Part 1. Comparability of Product Classes and Product Codes That Changed: 1992 to 1987

1992	1987	1992	1987	1992	1987	1992	1987
28161 00	28161 11	28248 75	28248 81	28446	28445	28795 81	28795 20
		28248 79	28248 81	28446 11	28445 02	28795 81	28795 21
28162 55	28161 21			28446 13	28445 03	28795 81	28795 79
28162 65	28162 13			28446 15	28445 04		
28162 65	28162 30	28249	28247	28446 17	28445 05	28796 85	28796 25
28162 65	28162 40	28249 15	28247 13	28446 19	28445 05	28796 85	28796 51
28162 65	28162 50	28249 15	28247 15	28446 21	28445 08	28796 85	28796 71
28162 65	28162 60	28249 15	28247 16	28446 22	28445 09	28796 85	28796 81
		28249 15	28247 19	28446 23	28445 16		
		28249 17	28247 13	28446 24	28445 17	28798 85	28798 30
28163 98	28163 41	28249 17	28247 15	28446 25	28445 18	28798 85	28798 83
28163 98	28163 45	28249 17	28247 16	28446 26	28445 19		
28163 98	28163 89	28249 17	28247 19	28446 29	28445 19		
28163 98	28163 95	28249 19	28247 31			28799 17	28799 15
28163 98	28163 97	28249 19	28247 33			28799 30	28799 35
		28249 19	28247 41	28447	28445	28799 45	28799 35
				28447 11	28445 21	28799 45	28799 15
28220 11	28220 00			28447 15	28445 22		28799 35
28220 12	28220 00			28447 21	28445 23		
28220 40	28220 00	28333 44	28333 43	28447 25	28445 25	28914 24	28914 23
28220 45	28220 00	28333 44	28333 45	28447 25	28445 25	28914 24	28914 25
28220 50	28220 00	28333 92	28333 93	28447 25	28445 29	28914 61	28914 98
28220 57	28220 00	28333 92	28333 94	28447 31	28445 27	28914 99	28914 98
28220 60	28220 00	28333 99	28333 82	28447 35	28445 28		
28220 72	28220 00	28333 99	28333 98	28447 41	28445 31	28916 25	28916 20
28220 82	28220 00			28447 45	28445 33	28916 25	28916 30
				28447 51	28445 39	28916 25	28916 40
		28352 12	28352 10			28917 46	28917 41
28230 33	28230 34	28352 12	28352 15	28447 55	28445 41	28917 46	28917 51
28230 33	28230 38			28447 61	28445 43	28917 46	28917 61
28230 33	28230 39			28447 65	28445 50		
28230 37	28230 34	28362 00	28362 10	28447 71	28445 61		
28230 37	28230 38	28362 00	28362 20	28447 75	28445 61	28920 20	28920 19
28230 37	28230 39			28447 81	28445 55	28920 20	28920 21
28230 45	28230 41			28447 85	28445 59	28920 24	28920 13
28230 45	28230 71	28364 22	28364 20	28447 95	28445 91	28920 24	28920 15
		28364 22	28364 25		28445 99	28920 24	28920 27
						28920 54	28920 51
28241 15	28241 13					28920 54	28920 57
28241 15	28241 19			28610	28611		
28241 15	28241 21	28411 78	28411 62			28931 17	28931 06
28241 15	28241 23	28411 78	28411 73			28931 17	28931 19
28241 15	28241 25	28411 78	28411 79				
28241 24	28241 13			28610	28612		
28241 24	28241 19			28610 10	28612 57		
28241 24	28241 21			28610 15	28611 31	28932 32	28932 33
28241 24	28241 21	28412 04	28412 07	28610 15	28611 98	28932 32	28932 38
28241 24	28241 23	28412 04	28412 08	28610 20	28612 91	28932 44	28932 34
28241 24	28241 23	28412 04	28412 15	28610 25	28612 94	28932 44	28932 45
28241 24	28241 25	28412 05	28412 07	28610 30	28612 96	28932 46	28932 34
28241 29	28241 13	28412 05	28412 15	28610 35	28612 98	28932 46	28932 45
		28412 06	28412 18	28610 40	28612 31		
28241 29	28241 19	28412 09	28412 12	28610 40	28612 61	28933 41	28933 43
28241 29	28241 21	28412 10	28412 12	28610 40	28612 89	28933 42	28933 43
28241 29	28241 23	28412 11	28412 15			28933 44	28933 45
28241 29	28241 25	28412 11	28412 18			28933 46	28933 45
28241 45	28241 35			28692	28695		
28241 45	28241 43			28692 10	28695 11		
		28413 12	28413 11	28692 15	28695 25	28934 87	28934 85
		28413 13	28413 11	28692 19	28695 27	28934 87	28934 86
28242	28247	28413 14	28413 11	28692 20	28695 11	28934 89	28934 85
28242 61	28247 13	28413 14	28413 11	28692 25	28695 25	28934 89	28934 86
28242 61	28247 15	28413 98	28413 22	28692 25	28695 25		
28242 61	28247 16	28413 98	28413 97	28692 29	28695 27		
28242 61	28247 19					28992 24	28992 23
28242 63	28247 13					28992 24	28992 25
28242 63	28247 15	28423 15	28423 95	28698	28695	28992 59	28992 53
28242 63	28247 15	28423 30	28423 95	28698 31	28695 31	28992 59	28992 55
28242 63	28247 16	28423 31	28423 95	28698 37	28695 37	28992 59	28992 57
28242 63	28247 19	28423 41	28423 45	28698 53	28695 53		
28242 65	28247 13	28423 46	28423 45	28698 55	28695 55		
28242 65	28247 15	28423 48	28423 47	28698 98	28695 98	28995 13	28995 11
		28423 48	28423 49			28995 13	28995 12
		28423 49	28423 42			28995 16	28995 14
28242 65	28247 16	28423 49	28423 42			28995 16	28995 19
28242 65	28247 19	28423 90	28423 95	28744 11	28744 20	28995 16	28995 15
28242 66	28247 31	28423 90	28423 95	28744 11	28744 40	28995 16	28995 19
28242 66	28247 33	28423 97	28423 95	28744 11	28744 60	28995 34	28995 35
28242 69	28247 41			28744 21	28744 20	28995 34	28995 36
				28744 21	28744 40	28995 43	28995 40
		28424 43	28424 42	28744 21	28744 60	28995 43	28995 42
		28424 43	28424 44	28744 31	28744 30	28995 43	28995 45
				28744 31	28744 50		
28244 15	28244 32			28744 31	28744 70	28995 68	28995 69
28244 15	28244 34					28995 68	28995 70
28244 15	28244 36					28995 68	28995 71
28244 15	28244 38	28430 55	28430 35			28995 81	28995 82
28244 15	28244 41	28430 55	28430 65			28995 81	28995 83
28244 29	28244 32			28750 11	28750 20	28995 81	28995 84
28244 29	28244 34			28750 11	28750 40	28995 81	28995 85
28244 29	28244 36	28443 26	28443 25	28750 11	28750 60	28995 86	28995 88
28244 29	28244 38	28443 26	28443 27	28750 21	28750 20	28995 86	28995 89
28244 29	28244 41			28750 21	28750 40	28995 86	28995 89
28244 42	28244 43			28750 21	28750 60	28995 95	28995 94
28244 42	28244 45	28444 31	28444 95	28750 31	28750 30	28995 95	28995 96
28244 44	28244 43	28444 98	28444 71	28750 31	28750 50	28995 97	28995 55
28244 44	28244 45	28444 98	28444 95	28750 31	28750 70	28995 97	28995 99

Part 2. Comparability of Product Classes and Product Codes That Changed: 1987 to 1992

1987		1992		1987		1992		1987		1992	
28161 11	28161 00	28247 16	28249 15	28445 02	28446 11	28795 20	28795 81				
28161 21	28162 55	28247 16	28249 17	28445 03	28446 13	28795 21	28795 81				
		28247 19	28242 61	28445 04	28446 15	28795 79	28795 81				
		28247 19	28242 63	28445 05	28446 17						
28162 13	28162 65	28247 19	28242 65	28445 05	28446 19	28796 25	28796 85				
28162 30	28162 65	28247 19	28249 15	28445 08	28446 21	28796 51	28796 85				
28162 40	28162 65	28247 19	28249 17	28445 09	28446 22	28796 71	28796 85				
28162 50	28162 65	28247 31	28242 66	28445 16	28446 23	28796 81	28796 85				
28162 60	28162 65	28247 31	28249 19	28445 17	28446 24						
		28247 33	28242 66	28445 18	28446 25	28798 30	28798 85				
28163 41	28163 98	28247 33	28249 19	28445 19	28446 26	28798 83	28798 85				
28163 45	28163 98	28247 41	28242 69								
28163 89	28163 98	28247 41	28249 19			28799 15	28799 17				
28163 95	28163 98			28445 19	28446 29	28799 15	28799 45				
28163 97	28163 98			28445 21	28447 11	28799 35	28799 30				
		28248 81	28248 75	28445 22	28447 15	28799 35	28799 40				
		28248 81	28248 79	28445 23	28447 21	28799 35	28799 45				
				28445 25	28447 25						
28220 00	28220 11			28445 27	28447 31	28914 23	28914 24				
28220 00	28220 12			28445 28	28447 35	28914 25	28914 24				
28220 00	28220 40	28333 43	28333 44	28445 29	28447 25	28914 98	28914 61				
28220 00	28220 45	28333 45	28333 44	28445 31	28447 41	28914 98	28914 99				
28220 00	28220 50	28333 82	28333 99	28445 33	28447 45						
28220 00	28220 57	28333 93	28333 92			28916 20	28916 25				
28220 00	28220 60	28333 94	28333 92			28916 30	28916 25				
28220 00	28220 72	28333 98	28333 99			28916 40	28916 25				
28220 00	28220 82										
		28352 10	28352 12	28445 39	28447 51						
28230 34	28230 33	28352 15	28352 12	28445 41	28447 55						
28230 34	28230 37			28445 43	28447 61	28917 41	28917 46				
28230 38	28230 33			28445 50	28447 65	28917 51	28917 46				
28230 38	28230 37			28445 55	28447 75	28917 61	28917 46				
28230 39	28230 33	28362 10	28362 00	28445 59	28447 81						
28230 39	28230 37	28362 20	28362 00	28445 61	28447 71						
28230 41	28230 45			28445 91	28447 85	28920 13	28920 24				
28230 71	28230 45	28364 20	28364 22	28445 99	28447 95	28920 15	28920 24				
		28364 25	28364 22			28920 19	28920 20				
						28920 21	28920 20				
						28920 27	28920 24				
28241 13	28241 15			28611	28610	28920 51	28920 54				
28241 13	28241 24	28411 62	28411 78	28611 31	28610 15	28920 57	28920 54				
28241 13	28241 29	28411 73	28411 78	28611 98	28610 15						
28241 19	28241 15	28411 79	28411 78			28931 06	28931 17				
28241 19	28241 24					28931 19	28931 17				
28241 19	28241 29										
28241 21	28241 15	28412 07	28412 04	28612	28610						
28241 21	28241 24	28412 07	28412 05	28612 31	28610 40	28932 33	28932 32				
28241 21	28241 29	28412 08	28412 04	28612 57	28610 10	28932 34	28932 44				
28241 21	28241 29	28412 12	28412 09	28612 61	28610 40	28932 34	28932 46				
28241 23	28241 15	28412 12	28412 10	28612 89	28610 40	28932 38	28932 32				
28241 23	28241 24	28412 15	28412 04	28612 91	28610 20	28932 45	28932 44				
		28412 15	28412 05	28612 94	28610 25	28932 45	28932 46				
28241 23	28241 29	28412 15	28412 11	28612 96	28610 30						
28241 25	28241 15	28412 15	28412 06	28612 98	28610 35						
28241 25	28241 24	28412 18	28412 11			28933 43	28933 41				
28241 25	28241 29					28933 43	28933 42				
28241 35	28241 45					28933 45	28933 44				
28241 43	28241 45					28933 45	28933 46				
		28413 11	28413 12	28695	28692						
		28413 11	28413 13			28934 43	28933 41				
		28413 11	28413 14	28695	28698	28934 45	28933 46				
		28413 22	28413 98								
28244 32	28244 15	28413 97	28413 98			28934 85	28934 87				
28244 32	28244 29					28934 85	28934 89				
28244 34	28244 15			28695 11	28692 10	28934 86	28934 87				
28244 34	28244 29			28695 11	28692 20	28934 86	28934 89				
28244 36	28244 15	28423 42	28423 49	28695 25	28692 15						
28244 36	28244 29	28423 45	28423 41	28695 25	28692 25	28992 23	28992 24				
28244 38	28244 15	28423 47	28423 46	28695 27	28692 19	28992 25	28992 24				
28244 38	28244 29	28423 48	28423 48	28695 27	28692 29	28992 53	28992 59				
28244 41	28244 15	28423 49	28423 48	28695 31	28698 31	28992 55	28992 59				
28244 41	28244 29	28423 95	28423 15	28695 37	28698 37	28992 57	28992 59				
28244 43	28244 42	28423 95	28423 30	28695 53	28698 53						
28244 43	28244 44	28423 95	28423 49	28695 55	28698 55	28995 11	28995 13				
28244 45	28244 42	28423 95	28423 90	28695 98	28698 98	28995 12	28995 13				
28244 45	28244 44	28423 95	28423 97			28995 14	28995 16				
						28995 15	28995 16				
						28995 15	28995 16				
						28995 19	28995 13				
				28744 20	28744 11	28995 19	28995 16				
28247	28242	28424 42	28424 43	28744 20	28744 21	28995 19	28995 16				
		28424 44	28424 43	28744 30	28744 31	28995 35	28995 34				
				28744 40	28744 11	28995 36	28995 34				
				28744 40	28744 21	28995 40	28995 43				
28247	28249	28430 35	28430 55	28744 50	28744 31	28995 42	28995 43				
		28430 65	28430 55	28744 60	28744 11	28995 45	28995 43				
				28744 60	28744 21						
28247 13	28242 61			28744 70	28744 31	28995 55	28995 97				
28247 13	28242 63					28995 69	28995 68				
28247 13	28242 65	28443 25	28443 26			28995 70	28995 68				
28247 13	28249 15	28443 27	28443 26			28995 71	28995 68				
28247 13	28249 17			28750 20	28750 11	28995 82	28995 81				
28247 15	28242 61	28444 71	28444 98	28750 20	28750 21	28995 83	28995 81				
28247 15	28242 63	28444 95	28444 31	28750 30	28750 31	28995 84	28995 81				
28247 15	28242 65	28444 95	28444 98	28750 40	28750 11	28995 88	28995 86				
28247 15	28249 15			28750 40	28750 21	28995 89	28995 86				
28247 15	28249 17			28750 50	28750 31	28995 89	28995 86				
28247 16	28242 61	28445	28446	28750 60	28750 11	28995 94	28995 95				
28247 16	28242 63			28750 60	28750 21	28995 96	28995 95				
28247 16	28242 65	28445	28447	28750 70	28750 31	28995 99	28995 97				

Part 3. Current Industrial Reports by Product Code

[Current Industrial Reports (CIR) data are contained in the publication *Manufacturing Profiles: 1992* [MP-1(92)] issued August 1994 and available through the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. To access the most current CIR data electronically, dial the Census-BEA Electronic Forum at 301-457-2310. Your communications modem should be set as follows: Baud rate: 1200, 2400, 9600; Parity: None; Data bits: 8; Stop bits: 1; Duplex: full. Before making your first call, decide on a password and be prepared to provide the following regarding your computer: PC brand name, monitor screen dimensions (e.g., 80 columns by 24 lines), monitor color support, modem baud rate, and PC communications software package. Call the voice number, 301-457-1242, for further bulletin board assistance]

Product code	Current Industrial Report	Product code	Current Industrial Report
2812100	MA28A, Inorganic Chemicals	2834200	MA28G, Pharmaceutical Preparations, Except Biologicals
2812300	MA28A, Inorganic Chemicals	2834300	MA28G, Pharmaceutical Preparations, Except Biologicals
2812500	MA28A, Inorganic Chemicals	2834400	MA28G, Pharmaceutical Preparations, Except Biologicals
2813200	MA28C, Industrial Gases	2834500	MA28G, Pharmaceutical Preparations, Except Biologicals
2813300	MA28C, Industrial Gases	2834600	MA28G, Pharmaceutical Preparations, Except Biologicals
2813500	MA28C, Industrial Gases	2834700	MA28G, Pharmaceutical Preparations, Except Biologicals
2813600	MA28C, Industrial Gases	2834800	MA28G, Pharmaceutical Preparations, Except Biologicals
2813700	MA28C, Industrial Gases	2834900	MA28G, Pharmaceutical Preparations, Except Biologicals
2816100	MA28A, Inorganic Chemicals	2842243	MA28A, Inorganic Chemicals
2816310	MA28A, Inorganic Chemicals	2842253	MA28A, Inorganic Chemicals
2819300	MA28B, Fertilizer Materials	2851100	MA28F, Paint, Varnish, and Lacquer
2819300	MA28A, Inorganic Chemicals	2851200	MA28F, Paint, Varnish, and Lacquer
2819400	MA28A, Inorganic Chemicals	2851300	MA28F, Paint, Varnish, and Lacquer
2819500	MA28A, Inorganic Chemicals	2851500	MA28F, Paint, Varnish, and Lacquer
2819600	MA28A, Inorganic Chemicals	2873100	MA28B, Fertilizer Materials
2819700	MA28A, Inorganic Chemicals		
2819800	MA28A, Inorganic Chemicals	2873200	MA28B, Fertilizer Materials
2819900	MA28A, Inorganic Chemicals	2874100	MA28B, Fertilizer Materials
2834100	MA28G, Pharmaceutical Preparations, Except Biologicals	2874200	MA28B, Fertilizer Materials

Publication Program

1992 CENSUS OF MANUFACTURES

Publications of the 1992 Census of Manufactures, containing preliminary and final data on manufacturing establishments in the United States, are described below. Publications order forms for the specific reports may be obtained from any Department of Commerce district office or from Data User Services Division, Customer Services, Bureau of the Census, Washington, DC 20233-8300.

Preliminary Reports

Industry series—83 reports (MC92-I-20A(P) to -39D(P))

Preliminary industry data are issued in 83 separate reports covering 459 industries. Preliminary summary data for the United States and States are released in one report.

Final Reports

Industry series—83 reports (MC92-1-20A to -39D)

Each of the 83 reports provides information for a group of related industries ("dairy products" includes industries for butter, cheese, milk, etc.). Final figures for the United States are shown for each of the 459 manufacturing industries on quantity and value of products shipped and materials consumed, cost of fuels and electric energy, capital expenditures, assets, rents, inventories, employment, payroll, payroll supplements, hours worked, value added by manufacture, number of establishments, and number of companies. Comparative statistics for earlier years are provided where available.

For each industry, data on value of shipments, value added by manufacture, capital expenditures, employment, and payroll are shown by employment-size class of establishment, State, and degree of primary product specialization.

Geographic area series—51 reports (MC92-A-1 to -51)

A separate report is being published for each State and the District of Columbia. Each report presents data for industry groups and industries on value of shipments, cost of materials, value added by manufacture, employment, payroll, hours worked, new capital expenditures, and number of manufacturing establishments for the State, MA's, counties, and selected places. Comparative statistics for earlier census years are shown for the State and large MA's. Manufacturing totals are presented for each county and for places with significant manufacturing activity. Detailed statistics (including inventories, assets, rents, and energy costs) are presented only in statewide totals.

Subject series—3 reports (MC92-S-1 to -3)

Each of the three reports contains detailed statistics for an individual subject, such as concentration ratios in manufacturing, manufacturers' shipments to the Federal Government, and a general national-level summary.

Reference series—1 report (MC92-R-1)

The *Numerical List of Manufactured and Mineral Products* includes a description of the principal products and services published in the 1992 Censuses of Manufactures and Mineral Industries.

Location of Manufacturing Plants—1 report (MC92-LM)

This report includes data for number of establishments by four-digit SIC industry and by employment-size class for counties, incorporated places of 2,500 inhabitants or more, and Zip Codes for each State. This report is available only on compact disc-read only memory (CD-ROM).

Analytical Reports—2 reports (AR92-1 and -2)

Exports From Manufacturing Establishments (AR92-1)

This report presents data on exports by two- and three-digit SIC industry groups for the United States and States. Information is presented on value of direct report shipments and estimates of the employment required to manufacture these products. Included are estimates of employment in manufacturing and nonmanufacturing establishments that supply parts, materials, and services for production of manufactured exports.

Selected Characteristics of Manufacturing Establishments That Export (AR92-2)

This report presents data on the number of manufacturing companies and establishments that export by major group, State, employment size, and ratios of exports to shipments.

Electronic Media

All data included in the printed reports are available on CD-ROM. The CD-ROM's provide the same information found in the reports as well as additional information not published in the final reports, such as location of manufacturing plants. Electronic media products are available for users who wish to summarize, rearrange, or process large amounts of data. These products, with corresponding technical documentation, are sold by Data User Services Division, Customer Services, Bureau of the Census, Washington, DC 20233-8300.

OTHER ECONOMIC CENSUSES REPORTS

Data on retail trade, wholesale trade, financial, insurance, real estate, service industries, construction industries, mineral industries, transportation, communications, utilities, enterprise statistics, minority-owned businesses, and women-owned businesses also are available from the 1992 Economic Census. A separate series of reports covers the census of outlying areas—Puerto Rico, Virgin Islands of the United States, Guam, and the Commonwealth of the Northern Mariana Islands. Separate announcements describing these reports are available free of charge from Data User Services Division, Customer Services, Bureau of the Census, Washington, DC 20233-8300.