

# Heating Equipment (Except Warm Air Furnaces) Manufacturing: 2002

Issued January 2005

EC02-311-333414 (RV)

## 2002 Economic Census

*Manufacturing*

Industry Series



U S C E N S U S B U R E A U

*Helping You Make Informed Decisions*

U.S. Department of Commerce  
Economics and Statistics Administration  
U.S. CENSUS BUREAU



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-- Not applicable for this report.

# Introduction to the Economic Census

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## **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. 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 economic census furnishes an important part of the framework for such composite measures as the gross domestic product estimates, input/output measures, production and price indexes, and other statistical series that measure short-term changes in economic conditions. Specific uses of economic census data include the following:

- Policymaking agencies of the federal government use the data to monitor economic activity and to assess the effectiveness of policies.
- 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, which allows them to 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.

## **INDUSTRY CLASSIFICATIONS**

Data from the 2002 Economic Census are published primarily according to the 2002 North American Industry Classification System (NAICS). NAICS was first adopted in the United States, Canada, and Mexico in 1997. The 2002 Economic Census covers the following NAICS sectors:

21	Mining
22	Utilities
23	Construction
31-33	Manufacturing
42	Wholesale Trade
44-45	Retail Trade
48-49	Transportation and Warehousing
51	Information
52	Finance and Insurance
53	Real Estate and Rental and Leasing
54	Professional, Scientific, and Technical Services
55	Management of Companies and Enterprises
56	Administrative and Support and Waste Management and Remediation Services
61	Educational Services
62	Health Care and Social Assistance
71	Arts, Entertainment, and Recreation
72	Accommodation and Food Services
81	Other Services (except Public Administration)

(Not listed above are the Agriculture, Forestry, Fishing, and Hunting sector (NAICS 11), partially covered by the census of agriculture conducted by the U.S. Department of Agriculture, and the Public Administration sector (NAICS 92), largely covered by the census of governments conducted by the Census Bureau.)

The 20 NAICS sectors are subdivided into 100 subsectors (three-digit codes), 317 industry groups (four-digit codes), and, as implemented in the United States, 1,179 industries (six-digit codes).

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## **RELATIONSHIP TO HISTORICAL INDUSTRY CLASSIFICATIONS**

Prior to the 1997 Economic Census, data were published according to the Standard Industrial Classification (SIC) system. While many of the individual NAICS industries correspond directly to industries as defined under the SIC system, most of the higher level groupings do not. Particular care should be taken in comparing data for retail trade, wholesale trade, and manufacturing, which are sector titles used in both NAICS and SIC, but cover somewhat different groups of industries. The 1997 Economic Census *Bridge Between NAICS and SIC* demonstrates the relationships between NAICS and SIC industries. Where changes are significant, it may not be possible to construct time series that include data for points both before and after 1997.

Most industry classifications remained unchanged between 1997 and 2002, but NAICS 2002 includes substantial revisions within the construction and wholesale trade sectors, and a number of revisions for the retail trade and information sectors. These changes are noted in industry definitions and will be demonstrated in the *Bridge Between NAICS 2002 and NAICS 1997*.

For 2002, data for enterprise support establishments (those functioning primarily to support the activities of their company's operating establishments, such as a warehouse or a research and development laboratory) are included in the industry that reflects their activities (such as warehousing). For 1997, such establishments were termed auxiliaries and were excluded from industry totals.

## **BASIS OF REPORTING**

The economic census is conducted on an establishment basis. A company operating at more than one location is required to file a separate report for each store, factory, shop, or other location. Each establishment is assigned a separate industry classification based on its primary activity and not that of its parent company. (For selected industries, only payroll, employment, and classification are collected for individual establishments, while other data are collected on a consolidated basis.)

## **GEOGRAPHIC AREA CODING**

Accurate and complete information on the physical location of each establishment is required to tabulate the census data for states, metropolitan and micropolitan statistical areas, counties, and corporate municipalities (places) including cities, towns, townships, villages, and boroughs. Respondents were required to report their physical location (street address, municipality, county, and state) if it differed from their mailing address. For establishments not surveyed by mail (and those single-establishment companies that did not provide acceptable information on physical location), location information from administrative sources is used as a basis for coding.

## **AVAILABILITY OF ADDITIONAL DATA**

All results of the 2002 Economic Census are available on the Census Bureau Internet site ([www.census.gov](http://www.census.gov)) and on digital versatile discs (DVD-ROMs) for sale by the Census Bureau. The American FactFinder system at the Internet site allows selective retrieval and downloading of the data. For more information, including a description of reports being issued, see the Internet site, write to the U.S. Census Bureau, Washington, DC 20233-6100, or call Customer Services at 301-763-4100.

## **HISTORICAL INFORMATION**

The economic census has been taken as an integrated program at 5-year intervals since 1967 and before that for 1954, 1958, and 1963. Prior to that time, individual components 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 the 1840 Decennial Census and subsequent censuses to include mining and some commercial activities. The 1905 Manufactures Census was the first time a census was taken apart

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from the regular decennial population census. Censuses covering retail and wholesale trade and construction industries were added in 1930, as were some service trades in 1933. Censuses of construction, manufacturing, and the other business censuses were suspended during World War II.

The 1954 Economic Census was the first census to be fully integrated, providing comparable census data across economic sectors and 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 report forms.

The range of industries covered in the economic census expanded between 1967 and 2002. The census of construction industries began on a regular basis in 1967, and the scope of service industries, introduced in 1933, was broadened in 1967, 1977, and 1987. While a few transportation industries were covered as early as 1963, it was not until 1992 that the census broadened to include all of transportation, communications, and utilities. Also new for 1992 was coverage of financial, insurance, and real estate industries. With these additions, the economic census and the separate census of governments and census of agriculture collectively covered roughly 98 percent of all economic activity. New for 2002 is coverage of four industries classified in the agriculture, forestry, and fishing sector under the SIC system: landscape architectural services, landscaping services, veterinary services, and pet care services.

Printed statistical reports from the 1992 and earlier censuses provide historical figures for the study of long-term time series and are available in some large libraries. Reports for 1997 were published primarily on the Internet and copies of 1992 reports are also available there. CD-ROMs issued from the 1987, 1992, and 1997 Economic Censuses contain databases that include all or nearly all data published in print, plus additional statistics, such as ZIP Code statistics, published only on CD-ROM.

#### **SOURCES FOR MORE INFORMATION**

More information about the scope, coverage, classification system, data items, and publications for the 2002 Economic Census and related surveys is published in the *Guide to the 2002 Economic Census* at [www.census.gov/econ/census02/guide](http://www.census.gov/econ/census02/guide). More information on the methodology, procedures, and history of the census will be published in the *History of the 2002 Economic Census* at [www.census.gov/econ/www/history.html](http://www.census.gov/econ/www/history.html).



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# Manufacturing

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## SCOPE

The Manufacturing sector (sector 31-33) comprises establishments engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products. The assembling of component parts of manufactured products is considered manufacturing, except in cases where the activity is appropriately classified in Sector 23, Construction.

Establishments in the manufacturing sector are often described as plants, factories, or mills and characteristically use power-driven machines and materials-handling equipment. However, establishments that transform materials or substances into new products by hand or in the worker's home and those engaged in selling to the general public products made on the same premises from which they are sold, such as bakeries, candy stores, and custom tailors, may also be included in this sector. Manufacturing establishments may process materials or may contract with other establishments to process their materials for them. Both types of establishments are included in manufacturing.

The materials, substances, or components transformed by manufacturing establishments are raw materials that are products of agriculture, forestry, fishing, mining, or quarrying, as well as products of other manufacturing establishments. The materials used may be purchased directly from producers, obtained through customary trade channels, or secured without recourse to the market by transferring the product from one establishment to another, under the same ownership. The new product of a manufacturing establishment may be finished in the sense that it is ready for utilization or consumption, or it may be semifinished to become an input for an establishment engaged in further manufacturing. For example, the product of the alumina refinery is the input used in the primary production of aluminum; primary aluminum is the input to an aluminum wire drawing plant; and aluminum wire is the input for a fabricated wire product manufacturing establishment.

The subsectors in the manufacturing sector generally reflect distinct production processes related to material inputs, production equipment, and employee skills. In the machinery area, where assembling is a key activity, parts and accessories for manufactured products are classified in the industry of the finished manufactured item when they are made for separate sale. For example, a replacement refrigerator door would be classified with refrigerators and an attachment for a piece of metal working machinery would be classified with metal working machinery. However, components, input from other manufacturing establishments, are classified based on the production function of the component manufacturer. For example, electronic components are classified in Subsector 334, Computer and Electronic Product Manufacturing; and stampings are classified in Subsector 332, Fabricated Metal Product Manufacturing.

Manufacturing establishments often perform one or more activities that are classified outside the manufacturing sector of NAICS. For instance, almost all manufacturing has some captive research and development or administrative operations, such as accounting, payroll, or management. These captive services are treated the same as captive manufacturing activities. When the services are provided by separate establishments, they are classified to the NAICS sector where such services are primary, not in manufacturing.

The boundaries of manufacturing and the other sectors of the classification system can be somewhat blurry. The establishments in the manufacturing sector are engaged in the transformation of materials into new products. Their output is a new product. However, the definition of what constitutes a new product can be somewhat subjective. As clarification, the following activities are

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considered manufacturing in NAICS: milk bottling and pasteurizing; water bottling and processing; fresh fish packaging (oyster shucking, fish filleting); apparel jobbing (assigning of materials to contract factories or shops for fabrication or other contract operations); as well as contracting on materials owned by others; printing and related activities; ready-mixed concrete production; leather converting; grinding of lenses to prescription; wood preserving; electroplating, plating, metal heat treating, and polishing for the trade; lapidary work for the trade; fabricating signs and advertising displays; rebuilding or remanufacturing machinery (i.e., automotive parts); ship repair and renovation; machine shops; and tire retreading.

**Exclusions.** There are activities that are sometimes considered manufacturing, but for NAICS are classified in another sector. These activities include logging, classified in Sector 11, Agriculture, Forestry, Fishing and Hunting is considered a harvesting operation; the beneficiating of ores and other minerals, classified in Sector 21, Mining, is considered part of the activity of mining; the construction of structures and fabricating operations performed at the site of construction by contractors, is classified in Sector 23, Construction; establishments engaged in breaking of bulk and redistribution in smaller lots, including packaging, repackaging, or bottling products, such as liquors or chemicals; the customized assembly of computers; sorting of scrap; mixing paints to customer order; and cutting metals to customer order, classified in Sector 42, Wholesale Trade or Sector 44-45, Retail Trade, produce a modified version of the same product, not a new product; and publishing and the combined activity of publishing and printing, classified in Sector 51, Information, perform the transformation of information into a product where as the value of the product to the consumer lies in the information content, not in the format in which it is distributed (i.e., the book or software diskette).

The tabulations for this sector do not include central administrative offices, warehouses, or other establishments that serve manufacturing establishments within the same organization. Data for such establishments are classified according to the nature of the service they provide. For example, separate headquarters establishments are reported in NAICS Sector 55, Management of Companies and Enterprises.

The reports described below exclude establishments of firms with no paid employees. These “nonemployers,” typically self-employed individuals or partnerships operating businesses that they have not chosen to incorporate, are reported separately in Nonemployer Statistics. The contribution of nonemployers, relatively small for this sector, may be examined at [www.census.gov/nonemployerimpact](http://www.census.gov/nonemployerimpact).

The reports described below cover all manufacturing establishments with one or more paid employees.

**Definitions.** Industry categories are defined in Appendix B, NAICS Codes, Titles, and Descriptions. Other terms are defined in Appendix A, Explanation of Terms.

## REPORTS

The following reports provide statistics on this sector:

**Industry Series.** There are 473 reports, each covering a single NAICS industry (six-digit code). These reports include such statistics as number of establishments, employment, payroll, value added by manufacture, cost of materials consumed, value of shipments, capital expenditures, etc. The industry reports also include data for states with 100 employees or more in the industry. The data in industry reports are preliminary and subject to change in the following reports.

**Geographic Area Series.** There are 51 separate reports, one for each state and the District of Columbia. Each state report presents similar statistics at the “all manufacturing” level for each state and its metropolitan and micropolitan areas with 250 employees or more, and for counties, consolidated cities, and places with 500 employees or more. The state reports also include six-digit NAICS level data for industries with 100 employees or more in the state.

### Subject Series:

x Manufacturing

2002 Economic Census

- **Industry-Product Analysis Summary.** This report presents value of shipments, value of product shipments, percentage of product shipments of the total value of shipments, and percentage of distribution of value of product shipments on the NAICS six-digit industry level and by the six- and seven-digit product code levels. It also includes miscellaneous receipts at the six- and seven-digit product code levels by NAICS six-digit industry levels.
- **General Summary.** This report contains industry and geographic area statistics summarized in one report. It includes higher levels of aggregation than the industry and state reports, as well as revisions to the data made after the release of the industry and state reports.
- **Product Summary.** This report summarizes the products data published in the industry reports. This report also includes a table with data for products that are primary to more than one industry, which are not in the industry reports.
- **Materials Summary.** This report summarizes the materials data published in the industry reports.
- **Concentration Ratio Summary.** This report publishes data on the percentage of value of shipments and value added accounted for by the 4-, 8-, 20-, and 50-largest companies for each manufacturing industry. Also shown in this report are Herfindahl-Herschmann indexes for each industry.
- **Location of Manufacturing Plants Summary.** This report contains statistics on the number of establishments for the three- and six-digit NAICS industry by state, county, place, and ZIP Code by employment-size of the establishment.

**ZIP Code Statistics.** This report contains statistics on the number of establishments for the three- and six-digit NAICS industry by employment-size of the establishment by ZIP Code.

**Other reports.** Data for this sector are also included in reports with multisector coverage, including Nonemployer Statistics, Comparative Statistics, Bridge Between 2002 NAICS and 1997 NAICS, Business Expenses, and the Survey of Business Owners reports.

## GEOGRAPHIC AREAS COVERED

The level of geographic detail varies by report. Maps are available at [www.census.gov/econ2002maps](http://www.census.gov/econ2002maps). Notes specific to areas in the state are included in Appendix D, Geographic Notes.

1. The United States as a whole.
2. States and the District of Columbia.
3. Metropolitan and micropolitan statistical areas with 250 employees or more. A core based statistical areas (CBSA) contains a core area with a substantial population nucleus, together with adjacent communities having a high degree of social and economic integration with that core. CBSAs are differentiated into metropolitan and micropolitan statistical areas based on size criteria. Both metropolitan and micropolitan areas are defined in terms of entire counties, and are listed in Appendix E, Metropolitan and Micropolitan Statistical Areas.
  - a. Metropolitan Statistical Areas (metro areas). Metro areas have at least one urbanized area of 50,000 or more population, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties.
  - b. Micropolitan Statistical Areas (micro areas). Micro areas have at least one urban cluster of at least 10,000 but less than 50,000 population, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties.
  - c. Metropolitan Divisions (metro divisions). If specified criteria are met, a metro area containing a single core with a population of 2.5 million or more may be subdivided to form smaller groupings of counties referred to as Metropolitan Divisions.

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- d. Combined Statistical Areas (combined areas). If specified criteria are met, adjacent metro and micro areas, in various combinations, may become the components of a new set of areas called Combined Statistical Areas. The areas that combine retain their own designations as metro or micro areas within the larger combined area.
4. Counties and county equivalents defined as of January 1, 2002, with 500 employees or more. Counties are the primary divisions of states, except in Louisiana where they are called parishes and in Alaska where they are called boroughs, census areas, and city and boroughs. Maryland, Missouri, Nevada, and Virginia have one place or more that is independent of any county organization and constitutes primary divisions of their states. These places are treated as counties and as places.
  5. Economic places with 500 employees or more.
    - a. Municipalities of 2,500 inhabitants or more defined as of January 1, 2002. These are areas of significant population incorporated as cities, boroughs, villages, or towns according to the 2000 Census of Population. For the economic census, boroughs and census areas in Alaska and boroughs in New York are not included in this category.
    - b. Consolidated cities defined as of January 1, 2002. Consolidated cities are consolidated governments that consist of separately incorporated municipalities.
    - c. Townships in Michigan, New Jersey, and Pennsylvania, and towns in New York, Wisconsin, and the six New England states with 10,000 inhabitants or more (according to the 2000 Census of Population).
    - d. Balance of county. Areas outside the entities listed above, including incorporated municipalities with populations of fewer than 2,500, town and townships not qualifying as noted above, and the remainders of counties outside places are categorized as "Balance of county."

## **DOLLAR VALUES**

All dollar values presented are expressed in current dollars; i.e., 2002 data are expressed in 2002 dollars, and 1997 data, in 1997 dollars. Consequently, when making comparisons with prior years, users of the data should consider the changes in prices that have occurred.

All dollar values are shown in thousands of dollars.

## **COMPARABILITY OF THE 1997 AND 2002 ECONOMIC CENSUSES**

Both the 2002 Economic Census and the 1997 Economic Census present data based on the North American Industry Classification System (NAICS). While there were revisions to selected industries for 2002, this sector is not affected by those revisions.

For 2002, there have been several additional data tables added, which did not exist in 1997. These tables for 2002 include products primary to more than one industry, industry-product analysis, e-commerce value of shipments, and leased and nonleased detail employment statistics by subsectors.

## **RELIABILITY OF DATA**

All data compiled for this sector are subject to nonsampling errors. Nonsampling errors can be attributed to many sources: inability to identify all cases in the actual universe; definition and classification difficulties; differences in the interpretation of questions; errors in recording or coding the data obtained; and other errors of collection, response, coverage, processing, and estimation for missing or misreported data. Selected data in tables titled "Detailed Statistics" are based on the Annual Survey of Manufactures and are subject to sampling errors as well as nonsampling errors.

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No direct measurement of these effects has been obtained except for estimation for missing or misreported data, as by the percentages shown in the tables. Precautionary steps were taken in all phases of the collection, processing, and tabulation of the data in an effort to minimize the effects of nonsampling errors. More information on the reliability of the data is included in Appendix C, Methodology.

## **DISCLOSURE**

In accordance with federal law governing census reports (Title 13 of the United States Code), no data are published that would disclose the operations of an individual establishment or company. However, the number of establishments in a specific industry or geographic area is not considered a disclosure; therefore, this information may be released even though other information is withheld. Techniques employed to limit disclosure are discussed at [www.census.gov/epcd/ec02/disclosure.htm](http://www.census.gov/epcd/ec02/disclosure.htm).

The disclosure analysis for "industry statistics" files 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 capital expenditures. Nonetheless, the suppressed data are included in higher-level totals. A separate disclosure analysis is performed for capital expenditures, which can be suppressed even though value of shipments data are published.

## **AVAILABILITY OF MORE FREQUENT ECONOMIC DATA**

The Census Bureau conducts the Annual Survey of Manufactures (ASM) in each of the 4 years between the economic censuses. The ASM is a probability-based sample of approximately 55,000 establishments and collects many of the same industry statistics (including employment, payroll, value of shipments, etc.) as the economic census. However, there are selected statistics not included in the ASM. Among these are the number of companies and establishments, detailed product and materials data, and substate geographic data. In addition to the ASM, the Census Bureau conducts the Current Industrial Reports (CIR) program. The CIR program publishes selected detailed product statistics for selected manufacturing industries at the U.S. level annually and, in some cases, monthly and/or quarterly. The Census Bureau also conducts the monthly Manufacturers' Shipments, Inventories, and Orders (M3) Program, which publishes detailed statistics for manufacturing industries at the U.S. level.

In addition, the County Business Patterns program offers annual statistics on the number of establishments, employment, and payroll classified by industry within each county, and Statistics of U.S. Businesses provides annual statistics classified by the employment size of the enterprise, further classified by industry for the United States, and by broader categories for states and metropolitan areas.

## **CONTACTS FOR DATA USERS**

Questions about these data may be directed to the U.S. Census Bureau, Manufacturing & Construction Division, Information Services Center, 301-763-4673 or [ask.census.gov](mailto:ask.census.gov).

## **ABBREVIATIONS AND SYMBOLS**

The following abbreviations and symbols are used with these data:

A	Standard error of 100 percent or more
D	Withheld to avoid disclosing data of individual companies; data are included in higher level totals
F	Exceeds 100 percent because data include establishments with payroll exceeding revenue
N	Not available or not comparable
S	Withheld because estimates did not meet publication standards
X	Not applicable
Z	Less than half the unit shown
a	0 to 19 employees
b	20 to 99 employees
c	100 to 249 employees

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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
p	10 to 19 percent estimated
q	20 to 29 percent estimated
r	Revised
s	Sampling error exceeds 40 percent
nsk	Not specified by kind
-	Represents zero (page image/print only)
(CC)	Consolidated city
(IC)	Independent city

**Table 1. Historical Statistics for the Industry: 2002 and Earlier Years**

[Data based on the 2002 Economic Census and the 2002 Annual Survey of Manufactures (ASM). For information on confidentiality protection, sampling error, nonsampling error, and explanation of terms, see note at end of table. For meaning of abbreviations and symbols, see introductory text]

Industry and year <sup>1</sup>	Com- panies <sup>2</sup>	All estab- lish- ments <sup>3</sup>	All employees		Production workers			Value added (\$1,000)	Total cost of materials (\$1,000)	Total value of shipments (\$1,000)	Total capital expendi- tures (\$1,000)	
			Number <sup>4</sup>	Payroll (\$1,000)	Number <sup>4</sup>	Hours (1,000)	Wages (\$1,000)					
333414, Heating equipment (except warm air furnaces) manufacturing .....	2002..	390	415	22 303	755 574	14 375	29 087	373 475	2 247 873	1 701 584	3 968 649	'88 292
	2001..	N	N	24 472	838 998	16 136	32 007	428 232	2 142 526	1 937 387	4 113 880	143 751
	2000..	N	N	26 010	857 834	17 324	33 538	435 655	2 320 046	2 014 847	4 315 407	149 396
	1999..	N	N	24 880	808 546	16 734	32 491	413 398	2 237 244	1 869 179	4 099 822	140 280
	1998..	N	N	23 510	719 194	15 400	30 039	354 384	1 964 955	1 632 354	3 738 536	273 737
	1997..	441	468	24 597	755 114	16 088	31 910	375 893	2 068 353	1 650 129	3 707 615	89 555

<sup>1</sup>Statistics presented for years ending in 2 and 7 are census data. Interim census years are derived in a representative sample of manufacturing establishments canvassed in the Annual Survey of Manufactures (ASM).

<sup>2</sup>For the census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

<sup>3</sup>Includes establishments with payroll at any time during the year.

<sup>4</sup>Number of employees figures represent average number of production workers for pay period that includes the 12th of March, May, August, and November plus other employees for payroll period that includes the 12th of March.

Note: The data in this table are based on the 2002 Economic Census and the 2002 Annual Survey of Manufactures (ASM). To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain sampling errors and nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C.



**Table 2. Industry Statistics for Selected States: 2002**

[States that are a disclosure or with less than 100 employees are not shown. Data based on the 2002 Economic Census. For information on confidentiality protection, nonsampling error, explanation of terms, and geographical definitions, see note at end of table. For information on geographic areas followed by \*, see Appendix D. For meaning of abbreviations and symbols, see introductory text]

Industry and geographic area	All establishments <sup>2</sup>			All employees		Production workers			Value added (\$1,000)	Total cost of materials (\$1,000)	Total value of shipments (\$1,000)	Total capital expenditures (\$1,000)
	E <sup>1</sup>	Total	With 20 employees or more	Number <sup>3</sup>	Payroll (\$1,000)	Number <sup>3</sup>	Hours (1,000)	Wages (\$1,000)				
<b>333414. Heating equipment (except warm air furnaces) manufacturing</b>												
United States .....	2	415	167	22 303	755 574	14 375	29 087	373 475	2 247 873	1 701 584	3 968 649	'88 292
California .....	1	54	22	3 070	100 989	1 917	4 199	49 146	270 823	212 931	487 002	'8 588
Connecticut .....	7	7	3	240	9 005	154	306	3 560	29 935	19 658	49 838	'692
Illinois .....	-	16	6	700	28 764	372	626	10 147	63 622	44 108	113 280	'2 757
Indiana .....	1	17	8	1 852	72 598	1 221	2 526	37 799	274 880	223 428	493 959	'3 882
Kentucky .....	1	3	3	1 058	33 712	670	1 265	14 139	99 672	85 525	187 907	'4 648
Massachusetts .....	6	11	7	739	28 803	405	851	11 203	58 012	43 465	102 542	'1 784
Michigan .....	1	17	4	309	14 118	162	327	4 914	37 347	27 132	62 381	'498
Minnesota .....	-	26	9	917	28 263	536	1 100	14 603	136 002	91 919	228 466	'7 719
Missouri .....	8	9	3	538	14 799	382	723	8 135	45 962	64 351	112 116	'1 796
New York .....	4	22	9	1 191	38 419	803	1 610	17 441	125 070	92 130	218 952	'2 505
North Carolina .....	6	9	6	588	16 824	440	926	12 278	46 553	34 543	81 454	'953
Ohio .....	-	18	9	1 123	44 219	611	1 305	18 019	87 430	90 263	180 653	'4 778
Oklahoma .....	7	6	2	125	4 533	83	164	2 161	12 164	7 850	20 014	'265
Pennsylvania .....	2	32	18	2 005	72 974	1 177	2 428	36 549	223 327	182 961	406 637	'17 340
Rhode Island .....	-	3	2	168	3 794	147	317	2 625	16 356	8 348	25 427	'360
Tennessee .....	-	11	6	1 218	31 750	964	1 741	19 972	95 260	65 637	163 036	'2 735
Texas .....	7	12	3	533	17 686	315	610	7 934	124 867	30 271	155 430	'1 362
Washington .....	3	14	6	988	34 547	673	1 355	19 210	79 313	68 548	147 002	'1 600
Wisconsin .....	5	15	7	543	20 425	336	645	8 394	55 511	34 367	87 717	'990

<sup>1</sup>Some payroll and sales data for 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 statistics 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 where estimated data account for 10 percent or more of the figures shown: 1-10 to 19 percent; 2-20 to 29 percent; 3-30 to 39 percent; 4-40 to 49 percent; 5-50 to 59 percent; 6-60 to 69 percent; 7-70 to 79 percent; 8-80 to 89 percent; 9-90 percent or more.

<sup>2</sup>Includes establishments with payroll at any time during the year.

<sup>3</sup>Number of employees figures represent average number of production workers for pay period that includes the 12th of March, May, August, and November plus other employees for payroll period that includes the 12th of March.

Note: The data in this table are based on the 2002 Economic Census. To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C. For geographical definitions, see Appendix D.

**Table 3. Detailed Statistics by Industry: 2002**

[Data based on the 2002 Economic Census and the 2002 Annual Survey of Manufactures (ASM). For information on confidentiality protection, sampling error, nonsampling error, and explanation of terms, see note 2 at end of table. For meaning of abbreviations and symbols, see introductory text]

Item	Value
<b>333414, Heating equipment (except warm air furnaces) manufacturing</b>	
Companies <sup>1</sup> .....	number.. 390
All establishments <sup>2</sup> .....	number.. 415
Establishments with 1 to 19 employees .....	number.. 248
Establishments with 20 to 99 employees .....	number.. 111
Establishments with 100 employees or more .....	number.. 56
All employees <sup>3</sup> .....	number.. 22 303
Total compensation .....	\$1,000.. 951 828
Annual payroll .....	\$1,000.. 755 574
Total fringe benefits .....	\$1,000.. 196 254
Production workers, average for year .....	number.. 14 375
Production workers on March 12 .....	number.. 13 846
Production workers on May 12 .....	number.. 14 202
Production workers on August 12 .....	number.. 14 929
Production workers on November 12 .....	number.. 14 505
Production worker hours .....	1,000.. 29 087
Production worker wages .....	\$1,000.. 373 475
Total cost of materials .....	\$1,000.. 1 701 584
Materials, parts, containers, packaging, etc., used .....	\$1,000.. 1 467 381
Resales .....	\$1,000.. 178 163
Purchased fuels .....	\$1,000.. 12 051
Purchased electricity .....	\$1,000.. 24 388
Contract work .....	\$1,000.. 19 601
Quantity of electricity purchased for heat and power .....	1,000 kWh.. 361 056
Quantity of electricity generated less sold for heat and power .....	1,000 kWh.. -
Total value of shipments .....	\$1,000.. 3 968 649
Primary products value of shipments .....	\$1,000.. 3 423 980
Secondary products value of shipments .....	\$1,000.. 234 523
Total miscellaneous receipts .....	\$1,000.. 310 146
Value of resales .....	\$1,000.. 282 886
Contract receipts .....	\$1,000.. 4 341
Other miscellaneous receipts .....	\$1,000.. 22 919
Primary products specialization ratio .....	percent.. 94
Value of primary products shipments made in all industries .....	\$1,000.. 3 856 924
Value of primary products shipments made in this industry .....	\$1,000.. 3 423 980
Value of primary products shipments made in other industries .....	\$1,000.. 432 944
Coverage ratio .....	percent.. 89
Value added .....	\$1,000.. 2 247 873
Total inventories, beginning of year .....	\$1,000.. 574 769
Finished goods inventories .....	\$1,000.. 250 723
Work-in-process inventories .....	\$1,000.. 81 541
Materials and supplies inventories .....	\$1,000.. 242 505
Total inventories, end of year .....	\$1,000.. 535 990
Finished goods inventories .....	\$1,000.. 233 424
Work-in-process inventories .....	\$1,000.. 79 648
Materials and supplies inventories .....	\$1,000.. 222 918
Gross value of depreciable assets (acquisition costs) at beginning of year .....	\$1,000.. '1 054 511
Total capital expenditures (new and used) .....	\$1,000.. '88 292
Buildings and other structures (new and used) .....	\$1,000.. '18 801
Machinery and equipment (new and used) .....	\$1,000.. '69 491
Automobiles, trucks, etc., for highway use .....	\$1,000.. '2 552
Computers and peripheral data processing equipment .....	\$1,000.. '6 193
All other expenditures for machinery and equipment .....	\$1,000.. '60 746
Total retirements .....	\$1,000.. '49 648
Gross value of depreciable assets at end of year .....	\$1,000.. '1 093 155
Depreciation charges during year .....	\$1,000.. '76 451
Total rental payments .....	\$1,000.. 43 490
Buildings and other structures .....	\$1,000.. 25 129
Machinery and equipment .....	\$1,000.. 18 361
Total other expenses <sup>4</sup> .....	\$1,000.. 360 974
Response coverage ratio <sup>5</sup> .....	percent.. 73
Repair and maintenance services of buildings and/or machinery <sup>4</sup> .....	\$1,000.. 19 668
Communications services <sup>4</sup> .....	\$1,000.. 8 607
Legal services <sup>4</sup> .....	\$1,000.. 7 794
Accounting, auditing, and bookkeeping services <sup>4</sup> .....	\$1,000.. 4 916
Advertising and promotional services <sup>4</sup> .....	\$1,000.. 64 664
Expensed computer hardware and supplies and purchased computer services <sup>4</sup> .....	\$1,000.. 4 216
Refuse removal (including hazardous waste) services <sup>4</sup> .....	\$1,000.. 3 619
Management consulting and administrative services <sup>4</sup> .....	\$1,000.. 7 223
Taxes and license fees <sup>4</sup> .....	\$1,000.. 8 209
All other expenses <sup>4</sup> .....	\$1,000.. 232 059

<sup>1</sup>For the census, a company is defined as a business organization consisting of one establishment or more under common ownership or control.

<sup>2</sup>Includes establishments with payroll at any time during the year.

<sup>3</sup>Number of employees figures represent average number of production workers for pay period that includes the 12th of March, May, August, and November plus other employees for payroll period that includes the 12th of March.

<sup>4</sup>Based on 2002 Annual Survey of Manufactures (ASM) sample data.

<sup>5</sup>A response coverage ratio is derived for this item by calculating the ratio of the weighted employment (establishment data multiplied by sample weight) for those Annual Survey of Manufactures (ASM) establishments that reported to the weighted total employment for all ASM establishments classified in this industry.

Note 1: The amounts shown for other expenses reflect only those services that establishments purchase from other companies.

Note 2: The data in this table are based on the 2002 Economic Census and the 2002 Annual Survey of Manufactures (ASM). To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain sampling errors and nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C.

**Table 4. Industry Statistics by Employment Size: 2002**

[Data based on the 2002 Economic Census. For information on confidentiality protection, nonsampling error, and explanation of terms, see note at end of table. For meaning of abbreviations and symbols, see introductory text]

Employment size class	E <sup>1</sup>	All establishments <sup>2</sup>	All employees		Production workers			Value added (\$1,000)	Total cost of materials (\$1,000)	Total value of shipments (\$1,000)	Total capital expenditures (\$1,000)
			Number <sup>3</sup>	Payroll (\$1,000)	Number <sup>3</sup>	Hours (1,000)	Wages (\$1,000)				
333414, Heating equipment (except warm air furnaces) manufacturing											
All establishments .....	2	415	22 303	755 574	14 375	29 087	373 475	2 247 873	1 701 584	3 968 649	'88 292
Establishments with—											
1 to 4 employees .....	9	131	269	9 059	187	327	4 538	24 395	16 002	40 513	'539
5 to 9 employees .....	8	63	388	14 616	257	524	6 964	38 623	27 486	65 911	'1 436
10 to 19 employees .....	3	54	742	27 809	461	893	12 120	65 036	42 683	108 166	'6 971
20 to 49 employees .....	2	55	1 858	67 982	1 197	2 439	30 516	158 514	118 594	276 763	'4 677
50 to 99 employees .....	4	56	4 215	142 780	2 796	5 592	70 136	474 817	317 704	796 590	'11 483
100 to 249 employees .....	2	33	5 427	187 885	3 487	6 868	91 381	459 213	350 951	815 719	'25 370
250 to 499 employees .....	2	18	6 239	215 690	4 060	8 496	114 721	687 512	526 394	1 221 405	'15 263
500 to 999 employees .....	—	5	3 165	89 753	1 930	3 948	43 099	339 763	301 770	643 582	22 553
1,000 to 2,499 employees .....	—	—	—	—	—	—	—	—	—	—	—
2,500 employees or more .....	—	—	—	—	—	—	—	—	—	—	—
Administrative records <sup>4</sup> .....	9	179	719	25 791	493	942	12 681	68 702	45 845	114 543	'1 621

<sup>1</sup>Some payroll and sales data for 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 statistics 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 where estimated data account for 10 percent or more of the figures shown: 1—10 to 19 percent; 2—20 to 29 percent; 3—30 to 39 percent; 4—40 to 49 percent; 5—50 to 59 percent; 6—60 to 69 percent; 7—70 to 79 percent; 8—80 to 89 percent; 9—90 percent or more.

<sup>2</sup>Includes establishments with payroll at any time during the year.

<sup>3</sup>Number of employees figures represent average number of production workers for pay period that includes the 12th of March, May, August, and November plus other employees for payroll period that includes the 12th of March.

<sup>4</sup>Some payroll and sales data for 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 statistics for these small establishments. Data are also included in respective size classes shown.

Note: The data in this table are based on the 2002 Economic Census. To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C.

**Table 5. Industry Statistics by Primary Product Class Specialization: 2002**

[Data based on the 2002 Economic Census. For information on confidentiality protection, nonsampling error, and explanation of terms, see note at end of table. For meaning of abbreviations and symbols, see introductory text]

Industry or product class code	Industry or primary product class	All establishments <sup>1</sup>	All employees		Production workers			Value added (\$1,000)	Total cost of materials (\$1,000)	Total value of shipments (\$1,000)	Total capital expenditures (\$1,000)
			Number <sup>2</sup>	Payroll (\$1,000)	Number <sup>2</sup>	Hours (1,000)	Wages (\$1,000)				
333414	Heating equipment (except warm air furnaces) manufacturing.....	415	22 303	755 574	14 375	29 087	373 475	2 247 873	1 701 584	3 968 649	'88 292
3334141	Cast iron heating boilers, radiators, and convectors (except parts) .....	25	3 065	118 899	1 858	3 997	56 908	494 188	313 058	807 522	'9 380
3334143	Domestic heating stoves (except electric and parts) .....	43	6 410	193 733	4 460	8 810	106 890	592 931	553 197	1 156 388	'18 342
3334145	Steel heating boilers (15 p.s.i. or less), and all other hot water heating boilers (except parts) .....	21	1 604	60 450	1 059	2 238	31 217	169 623	113 911	283 123	'14 548
3334147	Floor and wall furnaces, unit heaters, gas-fired infrared heaters, and mechanical stokers .....	31	2 391	89 782	1 515	3 081	41 481	224 567	157 807	382 853	'6 224
333414	Other heating equipment, except electric (including parts for nonelectric heating equipment and oil burners) .....	6	376	13 594	232	493	6 072	28 362	23 894	52 918	'752
333414A		80	7 051	232 432	4 324	8 645	107 937	632 182	461 001	1 100 723	'35 673

<sup>1</sup>Includes establishments with payroll at any time during the year.

<sup>2</sup>Number of employees figures represent average number of production workers for pay period that includes the 12th of March, May, August, and November plus other employees for payroll period that includes the 12th of March.

Note: The data in this table are based on the 2002 Economic Census. To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C.

**Table 6a. Products Statistics: 2002 and 1997**

[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. Data based on the 2002 Economic Census. For information on confidentiality protection, nonsampling error, and explanation of terms, see note 2 at end of table. For meaning of abbreviations and symbols, see introductory text]

Product code	Product	Number of companies with shipments of \$100,000 or more	Quantity of production for all purposes	Product shipments	
				Quantity	Value (\$1,000)
333414	Heating equipment (except warm air furnaces) manufacturing .....	2002.. N 1997.. N	X X	X X	3 856 924 3 579 512
3334141	Cast iron heating boilers, radiators, and convectors (except parts) .....	2002.. N 1997.. N	X X	X X	689 301 391 786
33341411	Cast iron boilers and radiators, and aluminum and other nonferrous metal radiators and convectors, including baseboard and finned tube type, residential, and special type (except electric) .....	2002.. N 1997.. N	X X	X X	659 979 387 687
3334141101	Gas-fired cast iron boilers (except parts) .....	2002.. 12 1997.. 9	X X	X 90.7	233 213 97 504
3334141106	Other cast iron boilers (except electric and parts) .....	2002.. 10 1997.. 10	X X	X 87.1	188 221 99 477
3334141111	Cast iron and steel radiators and convectors (except parts) .....	2002.. 11 1997.. 4	X X	X P11 737.5	173 180 148 180
3334141116	Aluminum and other nonferrous metal radiators and convectors, including baseboard and finned tube type, residential, industrial, and special type (except electric and parts) .....	2002.. 6 1997.. 6	X X	S S	65 365 42 526
3334141Y	Cast iron heating boilers, radiators, and convectors (except parts), nsk .....	2002.. N 1997.. N	X X	X X	29 322 4 099
3334141YVW	Cast iron heating boilers, radiators, and convectors (except parts), nsk .....	2002.. N 1997.. N	X X	X X	29 322 4 099
3334143	Domestic heating stoves (except electric and parts) .....	2002.. N 1997.. N	X X	X X	845 189 556 449
33341431	Heating stoves .....	2002.. N 1997.. N	X X	X X	844 539 540 662
3334143101	Gas fueled (all types) domestic hearth appliances (except electric and parts), B-vent, direct vent, vent-free (free-standing and fireplace insert) .....	2002.. 22 1997.. 18	X X	S P162.0	195 665 81 024
3334143106	Vented log sets .....	2002.. 11 1997.. 8	X X	S 385.3	36 073 14 387
3334143111	Ventless log sets .....	2002.. 18 1997.. 12	X X	P310.3 1 256.5	61 969 51 800
3334143116	B-vent built-in-appliances .....	2002.. 5 1997.. 3	X X	S D	15 483 D
3334143121	Direct vent built-in-appliances .....	2002.. 6 1997.. 3	X X	D D	D D
3334143126	Vent-free built-in-appliances .....	2002.. 5 1997.. 2	X X	S D	12 347 D
3334143131	Coal, kerosene, gasoline, and fuel oil domestic heating stoves (except parts) .....	2002.. 1 1997.. 5	X X	D Q22.7	D 6 063
3334143136	Freestanding wood fireplaces and domestic heating stoves (all types), including circulating and radiants (except parts) .....	2002.. 19 1997.. 19	X X	S P166.3	276 846 74 567
3334143141	Wood pellet fuel-burning domestic heaters (except parts) .....	2002.. 6 1997.. 8	X X	S P54.5	38 748 53 023
3334143146	Heat exchangers and zero clearance (factory built) domestic wood fireplaces .....	2002.. 2 1997.. 5	X X	D D	D D
3334143151	Domestic wood fireplace inserts .....	2002.. 14 1997.. 11	X X	S 96.0	53 889 36 969
3334143Y	Domestic heating stoves, except electric (except parts), nsk .....	2002.. N 1997.. N	X X	X X	650 15 787
3334143YVW	Domestic heating stoves, except electric (except parts), nsk .....	2002.. N 1997.. N	X X	X X	650 15 787
3334145	Steel heating boilers (15 p.s.i. or less), and all other hot water heating boilers (except parts) .....	2002.. N 1997.. N	X X	X X	242 621 219 582
33341451	Steel heating boilers (15 p.s.i. or less), and all other hot water heating boilers (except parts) .....	2002.. N 1997.. N	X X	X X	234 370 205 563
3334145101	Steel heating boilers (15 p.s.i. or less), and all other hot water heating boilers (except parts), 400,000 Btu per hour or less .....	2002.. 18 1997.. 19	X X	X X	119 437 98 940
3334145111	Steel heating boilers (15 p.s.i. or less), and all other hot water heating boilers (except parts), 400,001 Btu per hour or more (including scotch type and horizontal fire box) .....	2002.. 14 1997.. 13	X X	Q18.4 24.8	114 933 106 623
3334145Y	Steel heating boilers (15 p.s.i. or less), and all other hot water heating boilers (except parts), nsk .....	2002.. N 1997.. N	X X	X X	8 251 14 019
3334145YVW	Steel heating boilers (15 p.s.i. or less), and all other hot water heating boilers (except parts), nsk .....	2002.. N 1997.. N	X X	X X	8 251 14 019
3334147	Floor and wall furnaces, unit heaters, gas-fired infrared heaters, and mechanical stokers .....	2002.. N 1997.. N	X X	X X	441 886 526 335
33341471	Floor and wall furnaces, unit heaters, gas-fired infrared heaters, and mechanical stokers (including parts) .....	2002.. N 1997.. N	X X	X X	422 178 505 445
3334147101	Floor and wall furnaces (gas and oil) .....	2002.. 10 1997.. 13	X X	X X	94 040 94 412
3334147106	Gas-fired unit heaters, 400,000 Btu per hour or less .....	2002.. 20 1997.. 13	X X	X X	175 007 197 622
3334147111	Steam and hot water heating element, centrifugal fan-type (blower) and propeller fan-type unit heaters (except electric) .....	2002.. 10 1997.. 5	X X	X X	19 848 D

See footnotes at end of table.

**Table 6a. Products Statistics: 2002 and 1997—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. Data based on the 2002 Economic Census. For information on confidentiality protection, nonsampling error, and explanation of terms, see note 2 at end of table. For meaning of abbreviations and symbols, see introductory text]

Product code	Product	Number of companies with shipments of \$100,000 or more	Quantity of production for all purposes	Product shipments	
				Quantity	Value (\$1,000)
333414	Heating equipment (except warm air furnaces) manufacturing—Con.				
3334147	Floor and wall furnaces, unit heaters, gas-fired infrared heaters, and mechanical stokers—Con.				
33341471	Floor and wall furnaces, unit heaters, gas-fired infrared heaters, and mechanical stokers (including parts)—Con.				
3334147116	Gas-fired infrared heaters . . . . . thousands . . . . .	2002 . . . . . 14	X	S	59 048
		1997 . . . . . 15	X	429.5	87 500
3334147121	Mechanical stokers (except electric) . . . . .	2002 . . . . . 4	X	X	4 971
		1997 . . . . . 4	X	X	D
3334147126	Parts for floor and wall furnaces, unit heaters, gas-fired infrared heaters, and mechanical stokers . . . . .	2002 . . . . . 21	X	X	69 264
		1997 . . . . . 16	X	X	95 706
3334147Y	Floor and wall furnaces, unit heaters, infrared heaters, and mechanical stokers (including parts), nsk . . . . .	2002 . . . . . N	X	X	19 708
		1997 . . . . . N	X	X	20 890
3334147YV	Floor and wall furnaces, unit heaters, infrared heaters, and mechanical stokers (including parts), nsk . . . . .	2002 . . . . . N	X	X	19 708
		1997 . . . . . N	X	X	20 890
333414A	Other heating equipment, except electric (including parts for nonelectric heating equipment and oil burners) . . . . .	2002 . . . . . N	X	X	1 416 649
		1997 . . . . . N	X	X	N
333414A1	Other heating equipment, except electric (including parts for nonelectric heating equipment and oil burners) . . . . .	2002 . . . . . N	X	X	1 416 649
		1997 . . . . . N	X	X	N
333414A101	Oil burners . . . . .	2002 . . . . . 18	X	X	157 344
		1997 . . . . . N	X	X	N
333414A106	Parts and attachments for oil burners . . . . .	2002 . . . . . 14	X	X	49 220
		1997 . . . . . N	X	X	N
333414A111	Gas burners and gas conversion burners (including parts), 400,000 Btu per hour or less . . . . . thousands . . . . .	2002 . . . . . 17	X	S	89 765
		1997 . . . . . N	X	N	N
333414A116	Gas burners and gas conversion burners (including parts), 400,001 Btu per hour or more . . . . .	2002 . . . . . 18	X	X	104 697
		1997 . . . . . N	X	X	N
333414A121	Parts and attachments for gas burners (sold separately) . . . . .	2002 . . . . . 11	X	X	35 491
		1997 . . . . . N	X	X	N
333414A126	Heating unit ventilators (except electric) . . . . .	2002 . . . . . 9	X	X	70 619
		1997 . . . . . N	X	X	N
333414A131	Nonelectric prefabricated metal fireplaces for commercial and industrial use . . . . . thousands . . . . .	2002 . . . . . 4	X	S	15 946
		1997 . . . . . N	X	N	N
333414A136	Solar energy collectors (water or air) . . . . .	2002 . . . . . 7	X	X	35 304
		1997 . . . . . N	X	X	N
333414A138	Electric swimming pool heaters . . . . .	2002 . . . . . 6	X	X	114 854
		1997 . . . . . N	X	X	N
333414A140	Wall and baseboard heating units for permanent installation <sup>1</sup> . . . . .	2002 . . . . . 11	X	X	172 307
		1997 . . . . . N	X	X	N
333414A150	Parts, accessories, and attachments for wall and baseboard heating units <sup>1</sup> . . . . .	2002 . . . . . 3	X	X	11 042
		1997 . . . . . N	X	X	N
333414A151	Other heating equipment, including dual-fired gas and oil burners, heat transfer (blast) coils, range boilers, expansion tanks, direct-fired water heater tanks (including parts), except electric . . . . .	2002 . . . . . 70	X	X	560 060
		1997 . . . . . N	X	X	N
333414AY	Other heating equipment, except electric (including parts for nonelectric heating equipment and oil burners), nsk . . . . .	2002 . . . . . N	X	X	—
		1997 . . . . . N	X	X	N
333414AYV	Other heating equipment, except electric (including parts for nonelectric heating equipment and oil burners), nsk . . . . .	2002 . . . . . N	X	X	—
		1997 . . . . . N	X	X	N
333414W	Heating equipment (except warm air furnaces) manufacturing, nsk, total . . . . .	2002 . . . . . N	X	X	221 278
		1997 . . . . . N	X	X	313 917
333414WY	Heating equipment (except warm air furnaces) manufacturing, nsk, total . . . . .	2002 . . . . . N	X	X	221 278
		1997 . . . . . N	X	X	313 917
333414WYV	Heating equipment (except warm air furnaces) manufacturing, nsk, for nonadministrative-record establishments . . . . .	2002 . . . . . N	X	X	110 728
		1997 . . . . . N	X	X	210 081
333414WYVY	Heating equipment (except warm air furnaces) manufacturing, nsk, for administrative-record establishments . . . . .	2002 . . . . . N	X	X	110 550
		1997 . . . . . N	X	X	103 836

<sup>1</sup>For additional detail, see Current Industrial Report MA335E, Electric Housewares and Fans.

Note 1: For some establishments, data have been estimated from central unit values that 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: p–10 to 19 percent estimated; q–20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by S.

Note 2: The data in this table are based on the 2002 Economic Census. To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C.

**Table 6b. Product Class Shipments for Selected States: 2002 and 1997**

[Product classes covered are those that are economically significant and whose production is 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 2002. Data based on the 2002 Economic Census. For information on confidentiality protection, nonsampling error, explanation of terms, and geographic definitions, see note at end of table. For information on geographic areas followed by \*, see Appendix D. For meaning of abbreviations and symbols, see introductory text]

NAICS product class code	Product class and geographic area	Value of product shipments (\$1,000)
3334141	Cast iron heating boilers, radiators, and convectors (except parts)	
	United States .....	2002.. 689 301
	1997..	391 786
	New York .....	2002.. 79 718
1997..	N	
3334143	Domestic heating stoves (except electric and parts)	
	United States .....	2002.. 845 189
	1997..	556 449
	California .....	2002.. 101 927
	1997..	59 617
	North Carolina .....	2002.. 12 134
	1997..	20 803
	Tennessee .....	2002.. 56 845
1997..	140 153	
Washington .....	2002.. 109 999	
1997..	89 634	
3334145	Steel heating boilers (15 p.s.i. or less), and all other hot water heating boilers (except parts)	
	United States .....	2002.. 242 621
	1997..	219 582
	Minnesota .....	2002.. 12 169
	1997..	N
Pennsylvania .....	2002.. 57 039	
1997..	50 847	
3334147	Floor and wall furnaces, unit heaters, gas-fired infrared heaters, and mechanical stokers	
	United States .....	2002.. 441 886
	1997..	526 335
	California .....	2002.. 31 199
	1997..	N
	Illinois .....	2002.. 31 420
	1997..	N
	Indiana .....	2002.. 52 913
	1997..	N
	Michigan .....	2002.. 36 193
	1997..	70 109
	New York .....	2002.. 7 677
	1997..	N
Ohio .....	2002.. 47 319	
1997..	10 805	
333414A	Other heating equipment, except electric (including parts for nonelectric heating equipment and oil burners)	
	United States .....	2002.. 1 416 649
	1997..	N
	California .....	2002.. 121 976
	1997..	N
	Illinois .....	2002.. 58 584
	1997..	N
	Indiana .....	2002.. 52 497
	1997..	N
	Massachusetts .....	2002.. 44 894
	1997..	N
	Michigan .....	2002.. 18 959
	1997..	N
	Minnesota .....	2002.. 27 886
	1997..	N
	New York .....	2002.. 83 937
	1997..	N
	North Carolina .....	2002.. 54 394
	1997..	N
	Ohio .....	2002.. 130 986
	1997..	N
	Oklahoma .....	2002.. 12 827
1997..	N	
Pennsylvania .....	2002.. 111 577	
1997..	N	
Tennessee .....	2002.. 87 542	
1997..	N	
Wisconsin .....	2002.. 32 909	
1997..	N	

Note: The data in this table are based on the 2002 Economic Census. To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C. For geographical definitions, see Appendix D.

**Table 7. Materials Consumed by Kind: 2002 and 1997**

[Includes quantity and cost of materials consumed or put into production by establishments classified only in this industry. Data based on the 2002 Economic Census. For information on confidentiality protection, nonsampling error, and explanation of terms, see note 2 at end of table. For meaning of abbreviations and symbols, see introductory text]

Material code	Material consumed	Quantity	Delivered cost (\$1,000)
333414	Heating equipment (except warm air furnaces) manufacturing		
00900001	Total materials .....	2002.. X 1997.. X	1 467 381 1 496 258
33272203	Metal bolts, nuts, screws, washers, rivets, and other screw machine products .....	2002.. X 1997.. X	28 499 20 071
33290005	Fabricated metal pipe (excluding castings and forgings) .....	2002.. X 1997.. X	11 863 N
33341403	Metal parts and attachments specially designed for heating equipment (excluding electric) .....	2002.. X 1997.. X	32 194 N
33291905	Fabricated metal valves and pipe fittings .....	2002.. X 1997.. X	40 600 N
33200037	All other fabricated metal products (excluding forgings, metal stampings, valves and pipe fittings, fabricated metal pipe, bolts, nuts, screws, washers, and rivets) .....	2002.. X 1997.. X	138 235 242 958
33210000	Forgings .....	2002.. X 1997.. X	4 911 N
33151001	Iron and steel castings (rough and semifinished) .....	2002.. X 1997.. X	106 137 73 431
33152005	Aluminum and aluminum-base alloy castings (rough and semifinished) .....	2002.. X 1997.. X	9 853 N
33152009	Other nonferrous castings (rough and semifinished) .....	2002.. X 1997.. X	3 081 N
33120007	Steel bars, bar shapes, and plate (excluding castings, forgings, and fabricated metal products) .....	2002.. X 1997.. X	22 218 23 175
33120016	Steel sheet and strip (including tinplate) .....	2002.. X 1997.. X	148 181 N
33120069	Steel structural shapes (excluding castings, forgings, and fabricated metal products) .....	2002.. X 1997.. X	3 900 N
33120091	All other steel shapes and forms (excluding castings, forgings, fabricated metal products, bars, bar shapes, plate, sheet, strip, structural shapes, and sheet piling) .....	2002.. X 1997.. X	10 146 21 501
33100038	Aluminum and aluminum-base alloy shapes and forms (excluding castings, forgings, and fabricated metal products) .....	2002.. X 1997.. X	5 307 N
33142111	Copper and copper-base alloy shapes and forms (excluding castings, forgings, and fabricated metal products) .....	2002.. X 1997.. X	10 980 N
33100082	Other nonferrous metal shapes and forms (excluding aluminum and aluminum-base alloy and copper and copper-base alloy castings, forgings, and fabricated metal products) .....	2002.. X 1997.. X	3 393 N
332000AC	Metal stampings .....	2002.. X 1997.. X	6 503 N
33531221	Integral horsepower electric motors and generators (1 hp or more) .....	2002.. X 1997.. X	38 659 N
33451200	Automatic temperature controls (thermostats, regulators, etc.) .....	2002.. X 1997.. X	101 732 115 062
32221001	Paperboard containers, boxes, and corrugated paperboard .....	2002.. X 1997.. X	37 451 42 994
00970099	All other materials and components, parts, containers, and supplies .....	2002.. X 1997.. X	512 930 691 959
00971000	Materials, ingredients, containers, and supplies, nsk .....	2002.. X 1997.. X	190 608 265 107

Note 1: For some establishments, data have been estimated from central unit values that 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: p-10 to 19 percent estimated; q-20 to 29 percent estimated. If 30 percent or more is estimated, figure is replaced by S.

Note 2: The data in this table are based on the 2002 Economic Census. To maintain confidentiality, the Census Bureau suppresses data to protect the identity of any business or individual. The census results in this table contain nonsampling errors. Data users who create their own estimates using data from American FactFinder tables should cite the Census Bureau as the source of the original data only. For explanation of terms, see Appendix A. For full technical documentation, see Appendix C.



# Appendix A.

## Explanation of Terms

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### **BEGINNING- AND END-OF-YEAR INVENTORIES**

Respondents were asked to report their beginning-of-year and 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). Beginning 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.

### **Inventory data by stage of fabrication**

Total inventories and three detailed components (1)finished goods, (2)work-in-process, and (3)materials, supplies, fuels, etc., were collected.

When using inventory data by stage of fabrication for “all industries” and at the three-digit subsector 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 an 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 all publication levels.

### **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.

Included in this item are:

1. Cost of parts, components, containers, etc. Includes 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. Cost of products bought and sold in the same condition.
3. Cost of fuels consumed for heat and power. 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.
4. Cost of purchased electricity. The cost of purchased electric energy represents the amount actually used during the year for heat and power. In addition, information was 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.
5. Cost of contract work. This term applies to work done by others on materials furnished by the manufacturing establishment. The actual cost of the material is to be reported on the cost of materials, parts, and containers line of this item. The term “Contract Work” refers to the fee a company pays to another company to perform a service.

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## **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 that were important parts of the cost of production in a particular industry and for which cost information was available from manufacturers' records. If less than \$25,000 of a listed material was consumed by an establishment, the cost data could be reported in the "Cost of all other materials" Census material code 00970099.

Also, the cost of materials for small establishments for which administrative records or short forms were used was imputed into the "Materials not specified by kind" Census materials code 00971000.

## **Duplication in cost of materials and value of shipment**

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 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.

## **SELECTED PURCHASED SERVICES**

Annual Survey of Manufactures (ASM) establishments were requested to provide information on the cost of selected purchased services for the repair and maintenance services of buildings and/or machinery; communication services; legal services; accounting, auditing, and bookkeeping services; advertising and promotional services; expensed computer hardware and supplies and purchased computer services; refuse removal services; management consulting and administrative services; taxes and license fees; and all other expenses not previously stated. Each of these items reflects the costs paid directly by the establishment and excludes salaries paid to employees of the establishment for these services. These expenses are normally considered as nonproduction related costs purchased from other companies.

Included in the cost of selected purchased services for the repair and maintenance services of buildings and/or machinery are payments made for all maintenance and repair work on buildings and equipment. Payments made to other establishments of the same company and for repair and maintenance of any leased property also are included. Excluded from this item are extensive repairs or reconstruction that was capitalized, which is considered capital expenditures; costs incurred directly by the establishment in using its own work force to perform repairs and maintenance work; and repairs and maintenance provided by the building or machinery owner as part of the rental contract.

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Included in the cost of selected purchased services for communication is the actual expense incurred or payable during the year for any type of communication. Such types of communication include telephone, data transmission, telegraph, Internet, connectivity, FAX, telex, photo transmission, paging, cellular telephone, on-line access and related services, etc.

Included in the cost of selected purchased services for legal services are payments made to other companies for these services that were paid directly by the establishment. Excluded are the salaries paid to employees of the establishment for these services.

Included in the cost of selected accounting, auditing, and bookkeeping services are payments made to other companies for these services that were paid directly by the establishment. Excluded are the salaries paid to employees of this establishment for these services.

Included in the cost of selected advertising and promotional services are payments made to other companies for these services that were paid directly by the establishment. These include payments for printing, media coverage, and other services and materials. Excluded are the salaries paid to employees of this establishment for these services.

Included in the cost of selected expensed computer hardware and supplies and purchased computer services are actual expenses incurred or payable during the year for this item. Purchases for computer hardware and supplies, computer services (software, data transmission, processing services, Web design, etc.) are all included. Excluded are services provided by other establishments of the same company (such as a separate central data processing unit).

Included in the cost of selected purchased refuse removal services are payments made to other companies for these services that were paid directly by the establishment, including costs for hazardous waste removal or treatment. Excluded are all costs included in rental payments or as capital expenditures and the salaries paid to employees of the establishment for these services.

Included in the cost of selected purchased management consulting and administrative services are payments made to other companies for these services that were paid directly by the establishment. Excluded are the salaries paid to employees of this establishment for these services.

Included in the cost of selected purchased taxes and license fees are payments made to other companies for these services that were paid directly by the establishment, excluding income, sales, payroll, and excise taxes. Excluded are also the salaries paid to employees of this establishment for these services.

### **Response coverage ratio**

A response coverage ratio is a measure of the extent to which respondents report for an item. The estimate is made by calculating the ratio value of the weighted total employment data for all the ASM establishments that report the item to the weighted total employment data for all ASM establishments classified in an industry (reporters and nonreporters).

### **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.

### **NUMBER OF 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 that included the 12th of the months specified on the report form. Included are employees on paid sick leave, paid holidays, and paid vacations; not included are proprietors and partners of unincorporated businesses.

These individuals comprise of all full-time and part-time employees who are on the payrolls of establishments who worked or received pay for any part of the pay period including the 12th of March, May, August, and November.

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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**

The “production workers” number 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**

The “other employees” 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 truck drivers and their helpers), advertising, credit, collection, installation and servicing of own products, clerical and routine office functions, 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 utilized as a separate work force.

### **TOTAL FRINGE BENEFITS**

This item is the employer’s costs for social security tax, unemployment tax, workmen’s compensation insurance, state disability insurance pension plans, stock purchase plans, union-negotiated benefits, life insurance premiums, and insurance premiums on hospital and medical plans for employees.

Fringe benefits 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 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.

### **GROSS VALUE OF DEPRECIABLE ASSETS (ACQUISITION COSTS) AT BEGINNING OF YEAR (BOY) AND END OF YEAR (EOY)**

Total value of depreciable assets is collected on all census forms.

It shows the value of depreciable assets for the beginning of year (BOY) and end of year (EOY). The data encompass all fixed depreciable assets on the books of establishments. 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.

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In addition, respondents were requested to make certain that assets at the beginning of the year plus capital expenditures, less retirements, equaled assets at the end of the year.

## **ESTABLISHMENT**

An establishment is a single physical location where business is conducted or where services or industrial operations are performed. Data in this sector includes those establishments where manufacturing is performed. A separate report was required for each manufacturing establishment (plant) with one employee or more that were in operation at any time during the year.

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.

## **Company**

A company or ("enterprise") is comprised of all the establishments that operate under the ownership or control of a single organization. A company may be a business, service, or membership organization; consist of one or several establishments; and operate at one or several locations. It includes all subsidiary organizations, all establishments that are majority-owned by the company or any subsidiary, and all the establishments that can be directed or managed by the company or any subsidiary.

A company may have one or many establishments. Examples include product and service sales offices (retail and wholesale), industrial production plants, processing or assembly operations, mines or well sites, and support operations (such as an administrative office, warehouse, customer service center, or regional headquarters). Each establishment should receive, complete, and return a separate census form.

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.

## **PAYROLL**

This item includes the gross earnings of all employees on the payrolls of operating manufacturing establishments paid in the calendar year. 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' total supplemental labor costs (those required by federal and state laws and those incurred voluntarily or as part of collective bargaining agreements).

## **PRODUCT CODES AND CLASSES OF PRODUCTS**

NAICS United States industries are identified by a six-digit code. The longer code accommodates the large number of sectors and allows more flexibility in designing subsectors. Each product or service is assigned a ten-digit code. The product coding structure represents an extension by the Census Bureau of the six-digit industry classifications of the manufacturing and mining sectors. The classification system operates so that the industrial coverage is progressively narrower with the successive addition of digits.

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As in previous censuses, data were collected for most industries on the quantity and value of individual products shipped. Since the 1997 census programs, information is collected on the output of almost 10,000 individual product items.

In the manufacturing sector for 2002, there are 21 subsectors (three-digit NAICS), 86 industry groups (four-digit NAICS), 184 NAICS industries (five-digit NAICS) that are comparable with Canadian and Mexican classification, and 473 U.S. industries (six-digit NAICS). Product classes and products of the manufacturing industries have been assigned codes based on the industry from which they originate. There are 1,450 product classes (seven-digit codes), 5,674 census products, and an additional 3,746 ten-digit product codes. The ten-digit products are considered the primary products of the industry with the same first six digits.

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 1992 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 (quantity produced and consumed) 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.

### **PRODUCTION-WORKER HOURS**

This item covers all hours worked or paid for at the manufacturing plant, including actual overtime hours (not straight-time equivalent hours). It excludes hours paid for vacations, holidays, or sick leave when the employee was not at the establishment.

### **QUANTITY OF ELECTRICITY PURCHASED FOR HEAT AND POWER**

Data on the cost of purchased electric energy were collected on all census forms. However, data on the quantity of purchased electric energy were collected only on the Annual Survey of Manufactures (ASM) form. 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.

### **RENTAL PAYMENTS**

Total rental payments are 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.

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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.

### **RETIREMENTS OF DEPRECIABLE ASSETS**

Included in this item is the gross value of assets sold, retired, scrapped, destroyed, etc., during the calendar year. 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.

### **CAPITAL EXPENDITURES FOR NEW AND USED PLANT AND EQUIPMENT**

Represents the total new and used capital expenditures reported by establishments in operation and any known plants under construction.

These data include expenditures for:

1. Permanent additions and major alterations to manufacturing and mining establishments.
2. New and used machinery and equipment used for replacement and additions to plant capacity, if they are of the type for which depreciation, depletion, or (for mining establishments) Office of Minerals Exploration accounts are ordinarily maintained. In addition, for mining establishments, these data include expenditures made during the year for development and exploration of mineral properties. For manufacturing establishments, these data are broken down into three types.
  - a. Automobiles, trucks, etc. for highway use. These include vehicles acquired under a lease-purchase agreement and excludes vehicles leased or normally designed to transport materials, property, or equipment on mining, construction, petroleum development, and similar projects. These vehicles are of such size or weight as to be normally restricted by state laws or regulations from operating on public highways. It also excludes purchases of vehicles that are purchased by a company for highway use.
  - b. Computers and peripheral data processing equipment. This item include all purchases of computers and related equipment.
  - c. All other expenditures for machinery and equipment excluding automobiles and computer equipment.

Capital expenditures include work done by contract, as well as by the establishment's own workforce.

These data exclude expenditures for land and mineral rights and cost of maintenance and repairs charged as current operating expenses.

### **VALUE ADDED**

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.

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For those industries where value of production is collected instead of value of shipments, 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.

### **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 sold without further processing. Included are all items made by or for the establishments from material 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.

In addition to the value for NAICS defined products, aggregates of the following categories of miscellaneous receipts are reported as part of a total establishment’s value of product shipments: Reported contract work — receipts for work or services that a plant performed for others on their materials. Value of resales — sales of products brought and sold without further manufacture, processing, or assembly. Other miscellaneous receipts — such as repair work, installation, sales of scrap, etc.

Industry primary product value of shipments represents one of the three components of value of shipments. These components are: Primary products value of shipments. Secondary product value of shipments. Total miscellaneous receipts.

Primary product shipments is used in the calculations of industry specialization ratio and industry coverage ratio. The term “Value of primary products shipments made in this industry” is used in this publication and refers to the same data.

### **Duplication in cost of materials and value of shipment**

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.



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Before 1962, cost of materials and value of shipments were not published for some industries that 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.

### **Specialization and coverage ratio**

These items are not collected on the report forms, but are derived from the data shown in Table 3. 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 ratio have been developed to measure the relationship of primary product shipments to the data on shipments for the industry shown in Tables 1 through 5 and data on product shipments shown in Tables 6a and 6b.

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.

## Appendix B. NAICS Codes, Titles, and Descriptions

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### **333414 HEATING EQUIPMENT (EXCEPT WARM AIR FURNACES) MANUFACTURING**

This U.S. industry comprises establishments primarily engaged in manufacturing heating equipment (except electric and warm air furnaces), such as heating boilers, heating stoves, floor and wall furnaces, and wall and baseboard heating units.

# Appendix C.

## Methodology

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### SOURCES OF THE DATA

The manufacturing sector includes approximately 350,000 establishments. This number includes those industries in the North American Industry Classification System (NAICS) definition of manufacturing. The amount of information requested from manufacturing establishments was 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 (ASM).

Establishments in the 2002 Economic Census are divided into those sent report forms and those not sent report forms. The coverage of and the method of obtaining census information from each are described below:

1. Establishments sent a report form:

- a. ASM sample establishments. This group accounts for approximately 15 percent of all manufacturing establishments. The ASM panel covers 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. For more information, see the Description of the ASM Survey Sample.

In an economic census year, the ASM report form (MA-10000) 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 additional information on gross book value of assets and capital expenditures. ASM establishments were also requested to provide information on retirements, depreciation, rental payments, and supplemental labor costs. For establishments not included in the ASM, these additional items were estimated using relationships observed in the ASM establishment data. The census statistics for these variables are a sum of the ASM establishment data and the estimated data for non-ASM establishments. ASM establishments were also requested to provide information for selected purchased services. The census statistics for the purchased service items were derived solely from the ASM establishments. See Appendix A. Explanation of Terms, for an explanation of these items. The census part of the report form is 1 of 220 versions containing product, material, and special inquiries. The diversity of manufacturing activities necessitated the use of this many forms to canvass the 473 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 perform. Respondents were requested to identify the products, the value of each product, and, in certain 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

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for the respondent to describe significant materials not listed on the form.

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

- b. Large and medium establishments (non-ASM). Approximately 30 percent of all manufacturing establishments were included in this group. A variable cutoff, based on administrative-record payroll data and determined on an industry-by-industry basis, was used to select those establishments that were to receive 1 of the 220 economic census — manufacturing 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 includes approximately 15 percent of all manufacturing establishments. For those industries where application of the variable cutoff for administrative-record cases resulted in a large number of small establishments being included in the mail canvass, an abbreviated “short form” was used. These establishments received 1 of the 31 versions of the short form, which requested summary product and material data and totals but no details on employment, payroll, cost of materials, inventories, and capital expenditures.

Use of the short form has no adverse effect on published totals for the industry statistics, because the same data were collected on the short form as on the long form. However, detailed information on products and materials consumed was not collected on the short form; thus, its use would increase the value of the “not specified by kind” (nsk) categories.

## 2. Establishments not sent a report form:

- a. Small single-establishment companies not sent a report form. Approximately 40 percent of the manufacturing establishments were small single-establishment companies that were excused from filing a census report. Selection of these establishments was based on two factors: annual payroll and the Census Bureau’s ability to assign the correct six-digit NAICS industry classification to the establishment. For each six-digit NAICS industry code, an annual payroll cutoff was determined. These cutoffs were derived so that the establishments with payroll less than the cutoff were expected to account for no more than 3 percent of the value of shipments for the industry. Generally, all single-establishment companies with less than 5 employees were excused, while all establishments with more than 20 employees were mailed forms. Establishments below the cutoff that could not be directly assigned a six-digit NAICS code were mailed a classification report that requested information for assigning NAICS industry codes. Establishments below the cutoff that could be directly assigned a six-digit NAICS code were excused from filing any report. For below cutoff establishments, information on the physical location, payroll, and receipts was obtained from the administrative records of other federal agencies under special arrangements that 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” (nsk) categories.

The industry classification codes included in the administrative-record 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 to a six-digit NAICS industry. This was especially true whenever there was a relatively fine line of demarcation between industries or between manufacturing and nonmanufacturing activity.

Sometimes the administrative-record cases had only two- or three-digit NAICS group classification codes available in the files. For manufacturing, these establishments were sent a

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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 appropriate six-digit NAICS level. Establishments that did not return the classification form were coded later to those six-digit NAICS industries identified as “All other” industries within the given subsector.

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.

- b. All nonemployers, i.e., all firms subject to federal income tax, with no paid employees, during 2002 are excluded as in previous censuses. Data for nonemployers are not included in this report, but are released in the annual *Nonemployer Statistics* series.

The report forms used to collect information for establishments in this sector are available at [help.econ.census.gov/econhelp/resources/](http://help.econ.census.gov/econhelp/resources/).

A more detailed examination of census methodology is presented in the *History of the Economic Census* at [www.census.gov/econ/www/history.html](http://www.census.gov/econ/www/history.html).

## **INDUSTRY CLASSIFICATION OF ESTABLISHMENTS**

The classifications for all establishments covered in the 2002 Economic Census — Manufacturing are classified in 1 of 473 industries in accordance with the industry definitions in the *North American Industry Classification System (NAICS), United States, 2002* manual. There were no changes between the 2002 edition and the 1997 edition affecting this sector. When applicable, Appendix F of this report shows the product class and product comparability between the two systems for data in this report.

In the NAICS system, an industry is generally defined as a group of establishments that have similar production processes. To the extent practical, the system uses supply-based or production-oriented concepts in defining industries. The resulting group of establishments must be significant in terms of number, value added by manufacture, value of shipments, and number of employees.

The coding system works in such a way that the definitions progressively become narrower with successive additions of numerical digits. In the manufacturing sector for 2002, there are 21 subsectors (three-digit NAICS), 86 industry groups (four-digit NAICS), 184 NAICS industries (five-digit NAICS) that are comparable with Canadian and Mexican classification, and 473 U.S. industries (six-digit NAICS). Product classes and products of the manufacturing industries have been assigned codes based on the industry from which they originate. There are 1,450 product classes (seven-digit codes), 5,674 census products, and an additional 3,746 ten-digit product codes. The ten-digit products are considered the primary products of the industry with the same first six digits.

For the 2002 Economic Census — Manufacturing, all establishments were classified in particular industries based on the products they produced. If an establishment made products of more than one industry, it was classified in the industry with the largest product value. For 2002, there were no “resistance rules” or “frozen industries.”

In ASM years, establishments included in the ASM sample with certainty weights 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. However, in the following census year, these ASM plants are allowed to shift from one industry to another.

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The results of these rules covering the switching of plants from one industry classification to another are that some industries comprise different mixes of establishments in different survey years. Hence, comparisons between prior-year and current-year published totals, particularly at the six-digit NAICS 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-record 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.

Establishments frequently make products classified both in their industry (primary products) and other industries (secondary products). Industry statistics (employment, payroll, value added by manufacture, value of shipments, etc.) reflect the activities of the establishments that may make both primary and secondary products. Product statistics, however, represent the output of all establishments without regard for the classification of the producing establishment. For this reason, when relating the industry statistics, especially the value of shipments, to the product statistics, the composition of the industry's output should be considered.

The extent to which industry and product statistics may be matched with each other is measured by the primary product specialization ratio and the coverage ratio. The primary product specialization ratio is the proportion of industry shipments accounted for by the primary products of establishments classified in the industry. The coverage ratio is the proportion of product shipments accounted for by establishments classified in the industry.

#### **ESTABLISHMENT BASIS OF REPORTING**

The 2002 Economic Census — Manufacturing is conducted on an establishment basis. A company operating at more than one location is required to file a separate report for each location or establishment. 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 2002, 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.

The 2002 Economic Census — Manufacturing excludes data for central administrative offices (CAOs). These would include separately operated administrative offices, warehouses, garages, and other auxiliary units that service manufacturing establishments of the same company. These data are published in a separate report series.

#### **DESCRIPTION OF THE ASM SURVEY SAMPLE**

The ASM sample is drawn for the second survey year after a census. The most recent sample was drawn for the 1999 survey year based on the 1997 Economic Census — Manufacturing. This sample will be in place through the 2003 ASM.

In 1997, there were approximately 370,000 individual manufacturing establishments. For sample efficiency and cost considerations, the establishments in the 1997 manufacturing population were partitioned into two components for developing estimates within the ASM. The details of each are described below:

1. Mail stratum. The mail stratum of the survey is comprised of larger single-location manufacturing companies and all manufacturing establishments of multiunit companies (companies

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that operate at more than one physical location). Approximately 200,000 of the 370,000 establishments in the 1997 census were assigned to the mail stratum. On an annual basis, the mail stratum is supplemented with larger, newly active single-location companies identified from a list provided by the Internal Revenue Service (IRS) and new manufacturing locations of multiunit companies identified from the Census Bureau's Company Organization Survey (COS).

For the 1999 survey, a new sample of approximately 58,000 individual establishments was selected from the mail stratum assembled from the 1997 census. Supplemental samples representing both 1998 and 1999 births (newly active establishments that were not included in the 1997 census) were also selected. Establishments selected for the sample are mailed an ASM survey questionnaire for each year through 2003.

The 1999-2003 ASM sample design is similar to the one used since 1984. Companies in the 1997 Economic Census — Manufacturing with manufacturing shipments of at least \$500 million were defined as company certainties. For these large companies, each manufacturing establishment is included in the mail sample. For the 1999-2003 sample, there are approximately 500 certainty companies collectively accounting for over 18,000 establishments.

For the remaining portion of the mail component of the survey, the establishment was defined as the sample unit. All establishments with 250 employees or more were defined as employment certainties. Across these arbitrary certainty classes, there were approximately 25,000 establishments included in the sample with certainty. Collectively, these certainty establishments accounted for approximately 80 percent of the total value of shipments in the 1997 Economic Census — Manufacturing.

Smaller establishments in the remaining portion of the mail stratum were sampled with probabilities ranging from .02 to 1.00. The initial probabilities of selection assigned to these establishments were proportionate to a measure-of-size determined for each establishment. The measure-of-size was a function of the establishment's 1997 industry classification and its 1997 product class data. For each product class (1,755) and six-digit industry (473), a desired reliability constraint was specified. Using a technique developed by Dr. James R. Chromy of the Research Triangle Institute, the initial establishment probabilities were optimized such that the expected sample satisfied all industry and product class reliability constraints, while the sample size was minimized. This technique reduces the likelihood of selecting nonrepresentative samples for individual product classes or industries.

This method of assigning probabilities based on product class shipments is motivated by the Census Bureau's primary desire to produce reliable estimates of both product class and industry shipments. The high correlation between shipments and employment, value-added, and other general statistics assures that these variables will also be well represented by the sample. The actual sample selection procedure uses an independent chance of selection method (Poisson sampling) that permits us to prevent small establishments from being selected in consecutive samples without introducing a bias into the survey estimates.

2. Nonmail stratum. The initial nonmail component of the survey was comprised of approximately 170,000 small, single-establishment companies that were tabulated as administrative records in the 1997 Economic Census — Manufacturing. The nonmail stratum is also supplemented annually using the list of newly active single-location companies provided by the Internal Revenue Service (IRS) and payroll cutoffs. Companies with payroll below the payroll cutoff are added to the nonmail stratum. For this portion of the population, sampling is not used. The data for this group are estimated based on selected information obtained annually from the administrative records of the IRS and Social Security Administration (SSA). This administrative information, which includes payroll, total employment, industry classification, and physical location, is obtained under conditions which safeguard the confidentiality of both tax and census records.

## **RELIABILITY OF DATA**

All data compiled in the economic census are subject to nonsampling errors. Nonsampling errors can be attributed to many sources during the development or execution of the census. The following are two ways that further explain this method: ASM Estimating Procedure. Most of the ASM

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estimates derived for the mail stratum are computed using a difference estimator. At the establishment level, there is a strong correlation between the current-year data values and the corresponding 1997 (base) data values. Therefore, within the mailed stratum, for each item at each level of aggregation, an estimate of the “difference” between the current year and the base year is computed from sample cases and added to the corresponding base-year values. For the 1998-2002 ASM estimates, the 1997 Economic Census — Manufacturing values serve as the base year. For the 2003 ASM, the base will be updated to be the 2002 Economic Census — Manufacturing.

Due to the positive year-to-year correlation, estimates derived using this methodology are generally more reliable than comparable estimates developed from the current sample data alone. Estimates for the capital expenditures variables are not generated using the difference estimator because the year-to-year correlations are considerably weaker. The standard linear estimator is used for these variables.

For the nonmail stratum, estimates for payroll and employment are directly tabulated from the administrative-record data provided by IRS and SSA. Estimates of data other than payroll and employment are developed from industry averages. Although the nonmail stratum contained approximately 170,000 individual establishments in 1999, it accounts for less than 2 percent of the estimate for total value of shipments at the total manufacturing level.

Corresponding estimates for the mail and nonmail components are combined to produce the estimates included in this publication. ASM Data Qualifications. The estimates developed from the sample are apt to differ somewhat from the results of a survey covering all companies in the sample lists, but otherwise conducted under essentially the same conditions as the actual sample survey. The estimates of the magnitude of the sampling errors (the difference between the estimates obtained and the results theoretically obtained from a comparable, complete-coverage survey) are provided by the standard errors of estimates.

The particular sample selected for the ASM is one of many 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 theoretically comparable, complete-coverage values.

Estimates of the standard errors have been computed from the sample data for selected ASM statistics in this report. They are represented 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:

- From one standard error below to one standard error above the derived estimate for about two-thirds of all possible samples.
- From two standard errors below to two standard errors above the derived estimate for about 19 out of 20 of all possible samples.
- 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.



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For example, suppose an estimated total is shown at 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 during 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 moderately higher. However, for particular estimates, the total error may considerably exceed the standard errors shown. Any figures shown in the tables in this publication having an associated standard error exceeding 15 percent may be combined with higher level totals, creating a broader aggregate, which then may be of acceptable reliability.

#### **DUPLICATION IN COST OF MATERIALS AND VALUE OF SHIPMENTS**

Data for cost of materials and value of shipments include varying amounts of duplication, especially at higher levels of aggregation. This is because the products of one establishment may be the materials of another. The value added statistics avoid this duplication and are, for most purposes, the best measure for comparing the relative economic importance of industries and geographic areas.

#### **VALUE OF INDUSTRY SHIPMENTS COMPARED WITH VALUE OF PRODUCT SHIPMENTS**

The 2002 Economic Census — Manufacturing shows value of shipments data for industries and products. In the industry statistics tables and files, 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 the products statistics tables and files represent the total value of all products shipped that are classified as primary to an industry regardless of the classification of the producing establishment.

#### **DISCLOSURE**

In accordance with federal law governing census reports (Title 13 of the United States Code), no data are published that would disclose the operations of an individual establishment or company. However, the number of establishments in a specific industry or geographic area is not considered a disclosure; therefore, this information may be released even though other information is withheld. Techniques employed to limit disclosure are discussed at [www.census.gov/epcd/ec02/disclosure.htm](http://www.census.gov/epcd/ec02/disclosure.htm).

The disclosure analysis for the industry statistics files 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 capital expenditures. Nonetheless, the suppressed data are included in higher-level totals. A separate disclosure analysis is performed for capital expenditures, which can be suppressed even though value of shipments data are published.

# Appendix D. Geographic Notes

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Not applicable for this report.

# Appendix E. Metropolitan Areas and Micropolitan Statistical Areas

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Not applicable for this report.

# Appendix F. Comparability of Product Classes and Product Codes: 2002 to 1997

2002 published	2002 collected	1997 published	2002 published	2002 collected	1997 published	2002 published	2002 collected	1997 published
3331111	3331111	3331111	3331319	3331319	3331319	3332103YVW	3332103YVW	3332103YVW
333111100	333111100	333111000	333131901	333131901	333131901	3332105	3332105	3332105
3331114	3331113 pt	3331113 pt	333131906	333131906	333131906	3332105311	3332105211	3332105211
3331114100 pt	3331113110	3331113000 pt	333131911	333131911	333131911	3332105351 pt	3332105251 pt	3332105101
3331114100 pt	3331113YVW	3331113000 pt	3331319216	3331319216	3331319216	3332105351 pt	3332105251 pt	3332105221
3331117	3331117	3331117	3331319321	3331319321	3331319321	3332105351 pt	3332105251 pt	3332105231
3331117100	3331117100	3331117000	3331319426	3331319426	3331319426	3332105351 pt	3332105251 pt	3332105241
3331119	3331119	3331119	3331319531	3331319531	3331319531	3332105351 pt	3332105251 pt	3332105251
3331119100	3331119100	3331119000	3331319636	3331319636	3331319636	3332105YVW	3332105YVW	3332105YVW
333111A	333111A	333111A	3331319744	3331319744	3331319744	333210W	333210W	333210W
333111A100	333111A100	333111A000	3331319YVW	3331319YVW	3331319YVW	333210WYVW	333210WYVW	333210WYVW
333111C	333111C	333111C	333131WYVW	333131WYVW	333131WYVW	333210WYVW	333210WYVW	333210WYVW
333111C110	333111C110	333111C110	333131WYVW	333131WYVW	333131WYVW	3332201	3332201	3332201
333111C200	333111C200	333111C200	3331321	3331321	3331321	3332201106	3332201106	3332201106
333111CYVW	333111CYVW	333111CYVW	3331321101	3331321101	3331321101	3332201111	3332201111	3332201111
333111E	333111E	333111E	3331321116	3331321116	3331321116	3332201116	3332201116	3332201116
333111E100	333111E100	333111E000	3331321123 pt	3331321122 pt	3331321106	3332201121	3332201121	3332201121
333111G	333111G	333111G	3331321123 pt	3331321122 pt	3331321111	3332201201	3332201201	3332201201
333111G100	333111G100	333111G000	3331321126	3331321126	3331321122	3332201226	3332201226	3332201226
333111J	333111J	333111J	3331321131	3331321131	3331321126	3332201231	3332201231	3332201231
333111J100	333111J100	333111J000	3331321136	3331321136	3331321131	3332201236	3332201236	3332201236
333111W	333111W pt	333111W pt	3331321151	3331321151	3331321136	3332201341	3332201341	3332201341
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			3332103292 pt	3332103291 pt	3332103287	333291WYVW	333291WYVW	333291WYVW
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3332921358 pt	3332921358 pt	3332921356	3332945121	3332945121	3332945121	3332987276	3332987276	3332987276
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3332939132	3332939132	3332939132	3332985316	3332985316	3332985316	333313E100 pt	3399427YVW pt	3399425000 pt
3332939141	3332939141	3332939141	3332985YVW	3332985YVW	3332985YVW			
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3332939361	3332939361	3332939361	3332987	3332987	3332987	333313H100 pt	333313H10	333313G000 pt
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3332941121 pt	3332941131 pt	3332941102	3332987183 pt	3332987183 pt	3332987181	3333141100	3333141100	3333141000
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3333155116	3333155116	3333155116	3334120465	3334120465	3334120465	333415C100	333415C100	333415C000
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3333157	3333157	3333157	3334120688	3334120688	3334120688	333415D111	333415D111	333415D111
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3333157206	3333157206	3333157206	3334120YVW	3334120YVW	3334120YVW	333415D131	333415D131	333415D131
3333157311	3333157311	3333157311	3334141	3334141	3334141	333415D141	333415D141	333415D141
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333315WYVW	333315WYVW	333315WYVW	3334141116	3334141116	3334141116	333415D181	333415D181	333415D181
333315WYVW	333315WYVW	333315WYVW	3334141YVW	3334141YVW	3334141YVW	333415DYVW	333415DYVW	333415DYVW
3333191	3333191	3333191	3334143	3334143	3334143	333415E	333415E	333415E
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3333191131	3333191131	3333191131	3334143116	3334143116	3334143116	333415G	333415G	333415G
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3333191251	3333191251	3333191251	3334143126	3334143126	3334143126	333415W pt.	332322W pt.	332322W pt.
3333191261	3333191261	3333191261	3334143131	3334143131	3334143131	333415W pt.	333414W pt.	333414W pt.
3333191271	3333191271	3333191271	3334143136	3334143136	3334143136	333415W pt.	333415W pt.	333415W pt.
3333191281	3333191281	3333191281	3334143141	3334143141	3334143141	333415WYVW pt.	333415WYVW pt.	333415WYVW pt.
3333191391	3333191391	3333191391	3334143146	3334143146	3334143146	333415WYVW pt.	333415WYVW pt.	333415WYVW pt.
3333191YVW	3333191YVW	3333191YVW	3334143151	3334143151	3334143151	333415WYVW pt.	333415WYVW pt.	333415WYVW pt.
3333193	3333193	3333193	3334143YVW	3334143YVW	3334143YVW	3335110	3335110	3335110
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3333195	3333195	3333195	3334147	3334147	3334147	3335110421	3335110421	3335110421
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3333195YVW	3333195YVW	3333195YVW	333414A pt.	333414A pt.	333414A pt.	3335110481	3335110481	3335110481
3333197	3333197	3333197	333414A101	333414A101	333414A101	3335110486	3335110486	3335110486
3333197100	3333197100	3333197000	333414A106	333414A106	333414A106	3335110541	3335110541	3335110541
333319A pt.	333319A pt.	333319A	333414A111	333414A111	333414A111	3335110546	3335110546	3335110546
333319A pt.	333319A pt.	333319A pt.	333414A116	333414A116	333414A116	3335110551	3335110551	3335110551
333319A101	333319A101	333319A101	333414A121	333414A121	333414A121	3335110556	3335110556	3335110556
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333319A116	333319A116	333319A116	333414A136	333414A136	333414A136	3335110571	3335110571	3335110571
333319A146	333319A146	333319A146	333414A138	333414A138	333414A138	3335110576	3335110576	3335110576
333319A151	333319A151	333319A151	333414A140	333414A140	333414A140	3335110581	3335110581	3335110581
333319A161	333319A161	333319A161	333414A150	333414A150	333414A150	3335110586	3335110586	3335110586
333319A166	333319A166	333319A166	333414A151	333414A151	333414A151	3335110591	3335110591	3335110591
333319A171	333319A171	333319A171	333414AYVW pt.	333414AYVW pt.	333414AYVW pt.	3335110YVW	3335110YVW	3335110YVW
333319A174	333319A174	333319A174	333414AYVW pt.	333414AYVW pt.	333414AYVW pt.	3335110YVW	3335110YVW	3335110YVW
333319A178	333319A178	333319A178	333414W pt.	333414W pt.	333414W pt.	33351121	33351121	33351121
333319A182	333319A182	333319A182	333414W pt.	333414W pt.	333414W pt.	3335112100 pt.	3335112100 pt.	3335112100
333319A186	333319A186	333319A186	333414W pt.	333414W pt.	333414W pt.	3335112100 pt.	3335112100 pt.	33351121YVW
333319A189	333319A189	333319A189	333414WYVW pt.	333414WYVW pt.	333414WYVW pt.	33351122	33351122	33351122
333319A191	333319A191	333319A191	333414WYVW pt.	333414WYVW pt.	333414WYVW pt.	33351122100	33351122100	33351122000
333319A194	333319A194	333319A194	333414WYVW pt.	333414WYVW pt.	333414WYVW pt.	33351123	33351123	33351123
333319A196	333319A196	333319A196	333414WYVW pt.	333414WYVW pt.	333414WYVW pt.	33351123100	33351123100	33351123000
333319A221	333319A221	333319A221	3334152 pt.	332322E pt.	332322E pt.	33351124	33351124	33351124
333319A236	333319A236	333319A236	3334152 pt.	3334149 pt.	3334149 pt.	33351124100	33351124100	33351124000
333319A256	333319A256	333319A256	3334152 pt.	3334152 pt.	3334152 pt.	33351125	33351125	33351125
333319A299	333319A299	333319A299	3334152100 pt.	3321990 pt.	3321990 pt.	33351125101	33351125101	33351125101
333319A301	333319A301	333319A301	3334152100 pt.	3321990YVW pt.	3321990YVW pt.	33351125106	33351125106	33351125106
333319A326	333319A326	333319A326	3334152100 pt.	3321990YVW pt.	3321990YVW pt.	33351125116	33351125116	33351125116
333319A331	333319A331	333319A331	3334152100 pt.	3321990YVW pt.	3321990YVW pt.	33351125198 pt.	33351125198 pt.	33351125111
333319A341	333319A341	333319A341	3334152100 pt.	332322E109.	332322E106 pt.	33351125198 pt.	33351125198 pt.	33351125199
333319AYVW pt.	333319AYVW pt.	333319AYVW pt.	3334152100 pt.	332322EYVW pt.	332322EYVW pt.	33351125YVW	33351125YVW	33351125YVW
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333319W pt.	333319W pt.	333319W pt.	3334152100 pt.	3334149YVW pt.	3334149YVW pt.	33351126101	33351126101	33351126101
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333319WYVW pt.	333319WYVW pt.	333319WYVW pt.	3334152100 pt.	3334151100	3334151000	33351126111	33351126111	33351126106 pt.
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333319WYVW pt.	333319WYVW pt.	333319WYVW pt.	3334153101	3334153101	3334153101	33351126YVW	33351126YVW	33351126YVW
333319WYVW pt.	333319WYVW pt.	333319WYVW pt.	3334153106	3334153106	3334153106	33351127	33351127	33351127
3334111	3334111	3334111	3334153111	3334153111	3334153111	33351127100	33351127100	33351127000
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3334111YVW	3334111YVW	3334111YVW	3334153126	3334153126	3334153126	3335129	3335129	3335129
3334113	3334113	3334113	3334153131	3334153131	3334153131	3335129100	3335129100	3335129000
3334113103	3334113103	3334113103	3334153136	3334153136	3334153136	333512A	333512A	333512A
3334113207	3334113207	3334113207	3334153141	3334153141	3334153141	333512A100 pt.	333512A100 pt.	333512A100
3334113211	3334113211	3334113211	3334153146	3334153146	3334153146	333512A100 pt.	333512A100 pt.	333512AYVW
3334113231	3334113231	3334113231	3334153151	3334153151	3334153151	333512W	333512W	333512W
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3334113								

2002 published	2002 collected	1997 published	2002 published	2002 collected	1997 published	2002 published	2002 collected	1997 published
3335137	3335137	3335137	3335163	3335163	3335163	3336133444	3336133444	3336133444
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3335137111	3335137111	3335137111	3335163106	3335163106	3335163106	3336133648	3336133648	3336133648
3335137117	3335137117	3335137116 pt	3335163191	3335163191	3335163191	3336133649	3336133649	3336133649
3335137121	3335137121	3335137116 pt	3335163YVW	3335163YVW	3335163YVW	3336133756	3336133756	3336133756
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3335140	3335140	3335140	3335165116	3335165116	3335165116	3336133798	3336133798	3336133798
3335140101	3335140101	3335140101	3335165121	3335165121	3335165121	3336133YVW	3336133YVW	3336133YVW
3335140103	3335140103	3335140103	3335165YVW	3335165YVW	3335165YVW	333613W	333613W	333613W
3335140106	3335140106	3335140106	333516W	333516W	333516W	333613WYVW	333613WYVW	333613WYVW
3335140109	3335140109	3335140109	333516WYVW	333516WYVW	333516WYVW	333613WYVW	333613WYVW	333613WYVW
3335140112	3335140112	3335140112	333516WYVW	333516WYVW	333516WYVW	3336181	3336181	3336181
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3335140321	3335140321	3335140321	3335181206	3335181206	3335181206	3336183100	3336183100	3336183000
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3335140535	3335140535	3335140535	3335183	3335183	3335183	333618B pt	333618B pt	3336187
3335140538	3335140538	3335140538	3335183101	3335183101	3335183101	333618B pt	333618B pt	333618A
3335140541	3335140541	3335140541	3335183106	3335183106	3335183106	333618B pt	333618B pt	333618W pt
3335140543	3335140543	3335140543	3335183111	3335183111	3335183111	333618B101	333618B101	333618A101
3335140546	3335140546	3335140546	3335183116	3335183116	3335183116	333618B106	333618B106	333618A106
3335140549	3335140549	3335140549	3335183121	3335183121	3335183121	333618B108	333618B108	3336187100
3335140652	3335140652	3335140652	3335183126	3335183126	3335183126	333618B110	333618B110	333618WYVW pt
3335140655	3335140655	3335140655	3335183131	3335183131	3335183131	333618BYVW	333618BYVW	333618A
3335140658	3335140658	3335140658	3335183YVW	3335183YVW	3335183YVW	333618F	333618F	333618F
3335140661	3335140661	3335140661	333518W	333518W	333518W	333618F101	333618F101	333618F101
3335140663	3335140663	3335140663	333518WYVW	333518WYVW	333518WYVW	333618F106	333618F106	333618F106
3335140666	3335140666	3335140666	333518WYVW	333518WYVW	333518WYVW	333618F111	333618F111	333618F111
3335140769	3335140769	3335140769	3336110	3336110	3336110	333618F116	333618F116	333618F116
3335140772	3335140772	3335140772	3336110101	3336110101	3336110101	333618F121	333618F121	333618F121
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3335140YVW	3335140YVW	3335140YVW	3336110746	3336110746	3336110746	333618F141	333618F141	333618F141
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3335151	3335151	3335151	3336110766	3336110766	3336110766	333618F151	333618F151	333618F151
3335151102	3335151102	3335151102	3336110776 pt	3336110776 pt	3336110776 pt	333618F156	333618F156	333618F156
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3335151152	3335151152	3335151152	3336110YVW	3336110YVW	3336110YVW	333618F196	333618F196	333618F196
3335151188	3335151188	3335151188	3336110YVW	3336110YVW	3336110YVW	333618F199	333618F199	333618F199
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3335151308	3335151308	3335151308	3336123113	3336123113	3336123113	333618W	333618W	333618W pt
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3335151314	3335151314	3335151314	3336123118	3336123118	3336123118	333618WYVW	333618WYVW	333618WYVW pt
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3335151572	3335151572	3335151572	3336127329	3336127329	3336127329	333911WYVW	333911WYVW	333911WYVW
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3335153106	3335153106	3335153106	3336127773	3336127773	3336127773	333912WYVW	333912WYVW	333912WYVW
3335153111	3335153111	3335153111	3336127776	3336127776	3336127776	3339130	3339130	3339130
3335153116	3335153116	3335153116	3336127879	3336127879	3336127879	3339130113	3339130113	3339130113
3335153121	3335153121	3335153121	3336127983	3336127983	3336127983	3339130114	3339130114	3339130114
3335153126	3335153126	3335153126	3336127A88	3336127A88	3336127A88	3339130223	3339130223	3339130223
3335153131	3335153131	3335153131	3336127B99	3336127B99	3336127B99	3339130224	3339130224	3339130224
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3339211101	3339211101	3339211101	333923WYWW	333923WYWW	333923WYWW	3339921101	3339921101	3339921101
3339211106	3339211106	3339211106	333923WYWY	333923WYWY	333923WYWY	3339921106	3339921106	3339921106
333921211	333921211	333921211				3339921111	3339921111	3339921111
333921316	333921316	333921316	3339242 pt.	332618C pt.	332618B pt	3339921126	3339921126	3339921126
333921321	333921321	333921321				3339921131	3339921131	3339921131
333921326	333921326	333921326	3339242 pt.	3339241	3339241	3339921136	3339921136	3339921136
333921331	333921331	333921331	3339242101	3339241101	3339241101	3339921141	3339921141	3339921141
333921336	333921336	333921336	3339242104	3339241104	3339241104	3339921146	3339921146	3339921146
333921YVW	333921YVW	333921YVW	3339242208	3339241208	3339241208	3339921151	3339921151	3339921151
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3339213	3339213	3339213	3339242216	3339241216	3339241216	3339921161	3339921161	3339921161
3339213101	3339213101	3339213101	3339242321	3339241321	3339241321	3339921YVW	3339921YVW	3339921YVW
3339213106	3339213106	3339213106	3339242424	3339241424	3339241424			
3339213YVW	3339213YVW	3339213YVW	3339242528	3339241528	3339241528	3339923	3339923	3339923
			3339242532	3339241532	3339241532	3339923101	3339923101	3339923101
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333921W	333921W	333921W	3339242544	3339241544	3339241544	3339923111	3339923111	3339923111
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3339221101	3339221101	3339221101	3339242664	3339241664	3339241664	3339923136	3339923136	3339923136
3339221106	3339221106	3339221106	3339242668	3339241668	3339241668	3339923141	3339923141	3339923141
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3339221416	3339221416	3339221416	3339242676	3339241676	3339241676	3339923151	3339923151	3339923151
3339221421	3339221421	3339221421				3339923YVW	3339923YVW	3339923YVW
3339221426	3339221426	3339221426						
3339221431	3339221431	3339221431	3339242681	3339241681	3339241681	3339927	3339927	3339927
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3339221441	3339221441	3339221441	3339242688	3339241688	3339241688	3339927106	3339927106	3339927106
3339221446	3339221446	3339221446	3339242692	3339241692	3339241692	3339927111	3339927111	3339927111
3339221451	3339221451	3339221451	3339242696	3339241696	3339241696	3339927116	3339927116	3339927116
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3339221461	3339221461	3339221461	3339242702	3339241702	3339241702	3339927126	3339927126	3339927126
3339221YVW	3339221YVW	3339221YVW	3339242706	3339241706	3339241706	3339927131	3339927131	3339927131
			3339242YVW	3339241YVW	3339241YVW	3339927YVW	3339927YVW	3339927YVW
3339223	3339223	3339223	3339243	3339243	3339243			
3339223100	3339223100	3339223100	3339243101	3339243101	3339243101	3339929	3339929	3339929
3339228 pt.	3331113 pt.	3331113 pt.	3339243106	3339243106	3339243106	3339929101	3339929101	3339929101
			3339243111	3339243111	3339243111	3339929106	3339929106	3339929106
3339228 pt.	3339227 pt.	3339227 pt.	3339243YVW	3339243YVW	3339243YVW	3339929111	3339929111	3339929111
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3339228101	3339227101	3339227101	333924W pt.	332618W pt.	332618W pt	3339929121	3339929121	3339929121
3339228206	3339227206	3339227206	333924W pt.	333924W	333924W	3339929126	3339929126	3339929126
3339228211	3339227211	3339227211	333924WYWW pt.	332618WYWW pt.	332618WYWW pt	3339929YVW	3339929YVW	3339929YVW
3339228216	3339227216	3339227216	333924WYWW pt.	333924WYWW	333924WYWW			
3339228221	3339227221	3339227221	333924WYWY pt.	332618WYWY pt.	332618WYWY pt	333992A	333992A	333992A
3339228226	3339227226	3339227226	333924WYWY pt.	333924WYWY	333924WYWY	333992A101	333992A101	333992A101
3339228231	3339227231	3339227231				333992A116	333992A116	333992A116
3339228236	3339227236	3339227236	3339911	3339911	3339911	333992A121	333992A121	333992A121
3339228241	3339227241	3339227241	3339911101	3339911101	3339911101	333992A126	333992A126	333992A126
3339228246	3331113120	3331113000 pt	3339911106	3339911106	3339911106	333992A132 pt	333992A131 pt	333992A111
3339228251	3331113130	3331113000 pt	3339911111	3339911111	3339911111	333992A136 pt	333992A131 pt	333992A116
			3339911116	3339911116	3339911116	333992A141	333992A141	333992A141
3339228257 pt.	3339227257 pt.	3339227251	3339911121	3339911121	3339911121	333992A146	333992A146	333992A146
3339228276 pt.	3339227276 pt.	3339227276 pt	3339911126	3339911126	3339911126	333992AYVW	333992AYVW	333992AYVW
3339228276	3339227276	3339227276	3339911131	3339911131	3339911131			
3339228281	3339227281	3339227281	3339911136	3339911136	3339911136	333992W	333992W	333992W
3339228316	3339227316	3339227316	3339911141	3339911141	3339911141	333992WYWW	333992WYWW	333992WYWW
3339228466	3339227466	3339227466	3339911146	3339911146	3339911146	333992WYWY	333992WYWY	333992WYWY
3339228469 pt.	3339227469 pt.	3339227461	3339911151	3339911151	3339911151			
3339228469 pt.	3339227469 pt.	3339227471	3339911156	3339911156	3339911156	3339931	3339931	3339931
3339228YVW	3339227YVW	3339227YVW	3339911YVW	3339911YVW	3339911YVW	3339931103	3339931103	3339931103
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3339229	3339229	3339229	3339913	3339913	3339913	3339931311	3339931311	3339931311
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3339229YVW	3339229YVW	3339229YVW	3339913116	3339913116	3339913116	3339931426	3339931426	3339931426
			3339913YVW	3339913YVW	3339913YVW	3339931433	3339931433	3339931433
333922W pt.	333111W pt.	333111W pt				3339931437	3339931437	3339931437
						3339931544	3339931544	3339931544
333922W pt.	333922W pt.	333922W pt	3339917	3339917	3339917			
333922WYWW pt.	333111WYWW pt.	333111WYWW pt	3339917101	3339917101	3339917101	3339931545	3339931545	3339931545
333922WYWY pt.	333922WYWY pt.	333922WYWY pt	3339917106	3339917106	3339917106	3339931651	3339931651	3339931651
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			3339917116	3339917116	3339917116	3339931859	3339931859	3339931859
3339231	3339231	3339231	3339917121	3339917121	3339917121	3339931963	3339931963	3339931963
3339231101	3339231101	3339231101	3339917126	3339917126	3339917126	3339931A67	3339931A67	3339931A67
3339231106	3339231106	3339231106	3339917YVW	3339917YVW	3339917YVW	3339931A71	3339931A71	3339931A71
3339231111	3339231111	3339231111				3339931B75	3339931B75	3339931B75
3339231116	3339231116	3339231116	3339919	3339919	3339919	3339931B79	3339931B79	3339931B79
3339231121	3339231121	3339231121	3339919101	3339919101	3339919101	3339931B83	3339931B83	3339931B83
3339231131	3339231131	3339231131	3339919104	3339919104	3339919104	3339931C99	3339931C99	3339931C99
3339231141	3339231141	3339231141	3339919108	3339919108	3339919108	3339931YVW	3339931YVW	3339931YVW
3339231146	3339231146	3339231146	3339919112	3339919112	3339919112			
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3339231261	3339231261	3339231261	3339919121	3339919121	3339919121	3339935100	3339935100	3339935100
3339231YVW	3339231YVW	3339231YVW	3339919124	3339919124	3339919124			
			3339919128	3339919128	3339919128	333993W	333993W	333993W
3339233	3339233	3339233	3339919132	3339919132	3339919132	333993WYWW	333993WYWW	333993WYWW
3339233101	3339233101	3339233101	3339919136	3339919136	3339919136	333993WYWY	333993WYWY	333993WYWY
3339233111	3339233111	3339233111						
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3339233121	3339233121	3339233121	3339919144	3339919144	3339919144	3339940	3339940	3339940
3339233131	3339233131	3339233131	3339919148	3339919148	3339919148	3339940103	3339940103	3339940103
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3339955	3339955	3339955	3339971YVW	3339971YVW	3339971YVW	3339997 pt	3329995 pt	3329994 pt
3339955100	3339955100	3339955100	3339973	3339973	3339973	3339997 pt	3329995 pt	3329994 pt
3339957	3339957	3339957	3339973102 pt	3339973102 pt	3339973101	3339997109	3339998109	3339998109
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333995WYWW	333995WYWW	333995WYWW	3339973107	3339973107	3339973107	3339997425	3339998425	3339998425
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3339961	3339961	3339961	3339973YVW	3339973YVW	3339973YVW	3339997446	3339998446	3339998446
3339961100	3339961100	3339961100	3339975	3339975	3339975	3339997451	3339998451	3339998451
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3339967	3339967	3339967	3339975YVW	3339975YVW	3339975YVW	3339997880	3339998880	3339998880
3339967100	3339967100	3339967100	333997W	333997W	333997W	3339997983	3339998983	3339998983
3339969	3339969	3339969	333997WYWW	333997WYWW	333997WYWW	3339997986	3339998986	3339998986
3339969100	3339969100	3339969100	333997WYWY	333997WYWY	333997WYWY	3339997989	3339998989	3339998989
333996W	333996W	333996W	3339991	3339991	3339991	3339997994	3339998994	3339998994
333996WYWW	333996WYWW	333996WYWW	3339991104	3339991104	3339991104	3339997997	3329995121	3329994121
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3339971	3339971	3339971	3339991111	3339991111	3339991111	3339997YVW pt	3329995YVW pt	3329994YVW pt
3339971101	3339971101	3339971101	3339991212	3339991212	3339991212	3339997YVW pt	3329995YVW pt	3329994YVW pt
3339971103	3339971103	3339971103	3339991389	3339991389	3339991389	3339999A	3339999 pt	3339999 pt
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3339971207	3339971207	3339971207	3339993	3339993	3339993	3339999W pt	3329999W pt	3329999W pt
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			3339996	3339996	3339996	3339999WYWW pt	3329999WYWW pt	3329999WYWW pt
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						3339999WYWY pt	3329999WYWY pt	3329999WYWY pt

