

# Synthetic Rubber Manufacturing: 2002

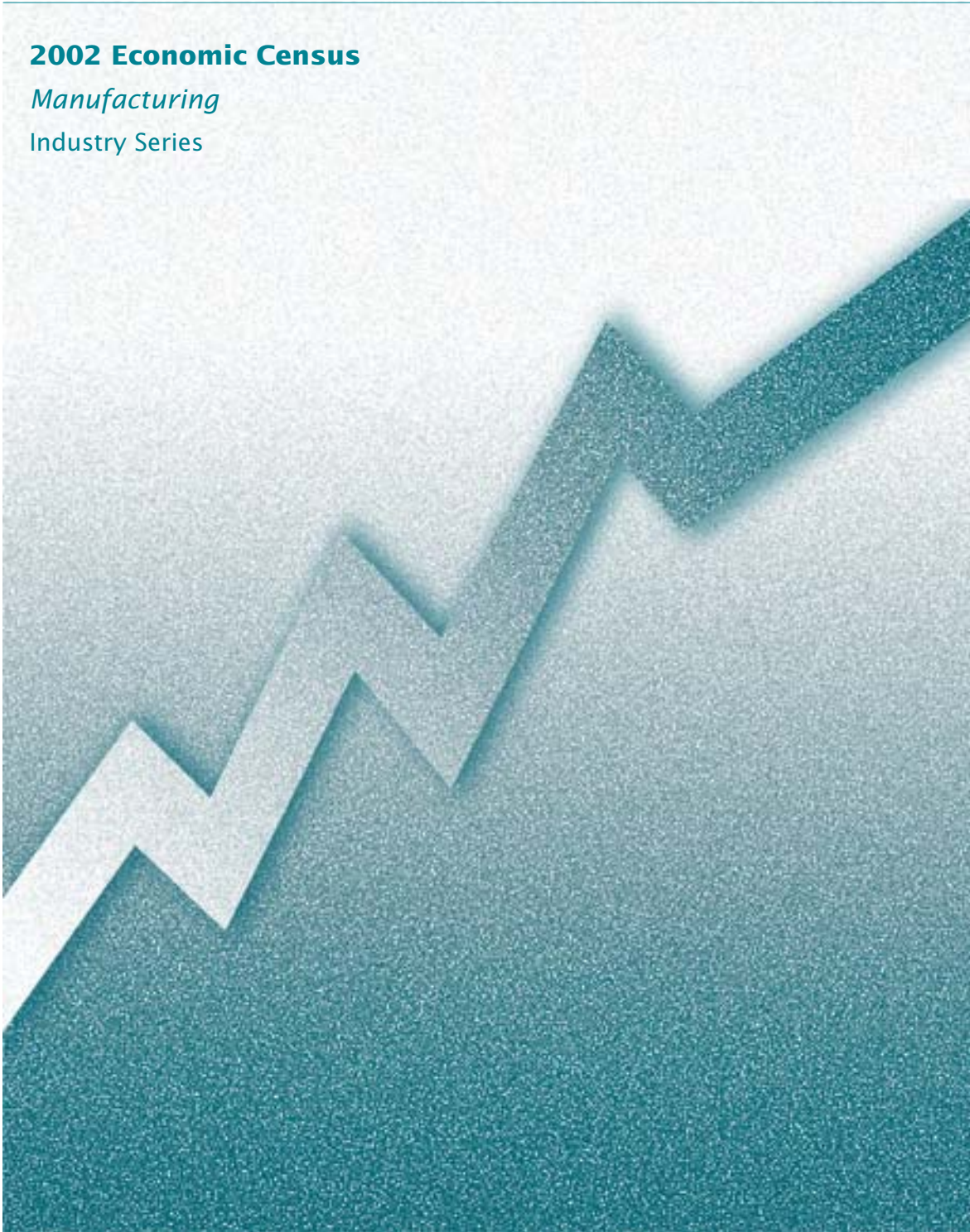
Issued January 2005

EC02-311-325212 (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)				
325212, Synthetic rubber manufacturing . . . 2002..	134	157	9 561	522 068	6 395	12 834	325 130	3 058 793	2 828 597	5 782 311	'284 242
2001..	N	N	9 047	495 178	6 041	13 158	298 691	2 084 162	2 967 545	5 204 008	168 802
2000..	N	N	10 786	598 203	7 238	15 345	356 299	2 444 952	3 477 550	5 835 814	343 783
1999..	N	N	11 212	613 516	7 346	16 087	356 065	2 862 695	2 738 780	5 571 073	295 290
1998..	N	N	10 912	596 454	7 101	15 692	350 542	2 528 824	2 774 641	5 342 742	349 308
1997..	122	144	12 172	628 341	7 819	16 705	366 002	2 773 333	3 394 947	6 153 708	388 526

<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)				
325212, Synthetic rubber manufacturing												
United States.....	1	157	62	9 561	522 068	6 395	12 834	325 130	3 058 793	2 828 597	5 782 311	'284 242
California .....	5	29	6	579	25 111	343	685	15 444	76 230	79 416	154 877	'4 882
Georgia .....	2	6	3	293	18 003	183	394	10 429	162 592	145 099	305 375	'6 822
Illinois .....	2	8	2	114	4 490	72	142	2 180	14 140	13 732	27 520	'1 919
Indiana .....	9	7	4	223	9 116	151	282	4 603	64 428	59 735	124 186	'3 139
Kentucky .....	—	4	3	1 045	62 555	652	1 349	37 264	278 296	243 667	510 824	'14 585
Louisiana .....	—	6	6	1 361	84 137	952	2 032	56 366	511 901	619 908	1 126 399	'96 125
Texas .....	1	22	12	2 540	150 965	1 742	3 735	97 423	829 189	951 250	1 772 885	'101 277

<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>325212, Synthetic rubber manufacturing</b>	
Companies <sup>1</sup> .....	number.. 134
All establishments <sup>2</sup> .....	number.. 157
Establishments with 1 to 19 employees .....	number.. 95
Establishments with 20 to 99 employees .....	number.. 35
Establishments with 100 employees or more .....	number.. 27
All employees <sup>3</sup> .....	number.. 9 561
Total compensation .....	\$1,000.. 705 292
Annual payroll .....	\$1,000.. 522 068
Total fringe benefits .....	\$1,000.. 183 224
Production workers, average for year .....	number.. 6 395
Production workers on March 12 .....	number.. 6 438
Production workers on May 12 .....	number.. 6 316
Production workers on August 12 .....	number.. 6 398
Production workers on November 12 .....	number.. 6 405
Production worker hours .....	1,000.. 12 834
Production worker wages .....	\$1,000.. 325 130
Total cost of materials .....	\$1,000.. 2 828 597
Materials, parts, containers, packaging, etc., used .....	\$1,000.. 2 427 777
Resales .....	\$1,000.. 105 734
Purchased fuels .....	\$1,000.. 158 409
Purchased electricity .....	\$1,000.. 90 676
Contract work .....	\$1,000.. 46 001
Quantity of electricity purchased for heat and power .....	1,000 kWh.. 1 910 413
Quantity of electricity generated less sold for heat and power .....	1,000 kWh.. D
Total value of shipments .....	\$1,000.. 5 782 311
Primary products value of shipments .....	\$1,000.. 4 930 883
Secondary products value of shipments .....	\$1,000.. 741 154
Total miscellaneous receipts .....	\$1,000.. 110 274
Value of resales .....	\$1,000.. 108 994
Contract receipts .....	\$1,000.. D
Other miscellaneous receipts .....	\$1,000.. D
Primary products specialization ratio .....	percent.. 87
Value of primary products shipments made in all industries .....	\$1,000.. 5 984 702
Value of primary products shipments made in this industry .....	\$1,000.. 4 930 883
Value of primary products shipments made in other industries .....	\$1,000.. 1 053 819
Coverage ratio .....	percent.. 82
Value added .....	\$1,000.. 3 058 793
Total inventories, beginning of year .....	\$1,000.. 679 167
Finished goods inventories .....	\$1,000.. 435 580
Work-in-process inventories .....	\$1,000.. 88 696
Materials and supplies inventories .....	\$1,000.. 154 891
Total inventories, end of year .....	\$1,000.. 811 600
Finished goods inventories .....	\$1,000.. 565 215
Work-in-process inventories .....	\$1,000.. 64 140
Materials and supplies inventories .....	\$1,000.. 182 245
Gross value of depreciable assets (acquisition costs) at beginning of year .....	\$1,000.. '5 004 152
Total capital expenditures (new and used) .....	\$1,000.. '284 242
Buildings and other structures (new and used) .....	\$1,000.. '26 979
Machinery and equipment (new and used) .....	\$1,000.. '257 263
Automobiles, trucks, etc., for highway use .....	\$1,000.. '941
Computers and peripheral data processing equipment .....	\$1,000.. '8 333
All other expenditures for machinery and equipment .....	\$1,000.. '247 989
Total retirements .....	\$1,000.. '226 631
Gross value of depreciable assets at end of year .....	\$1,000.. '5 061 763
Depreciation charges during year .....	\$1,000.. '252 418
Total rental payments .....	\$1,000.. 26 585
Buildings and other structures .....	\$1,000.. 11 699
Machinery and equipment .....	\$1,000.. 14 886
Total other expenses <sup>4</sup> .....	\$1,000.. 439 217
Response coverage ratio <sup>5</sup> .....	percent.. 77
Repair and maintenance services of buildings and/or machinery <sup>4</sup> .....	\$1,000.. 97 262
Communications services <sup>4</sup> .....	\$1,000.. 3 844
Legal services <sup>4</sup> .....	\$1,000.. 2 932
Accounting, auditing, and bookkeeping services <sup>4</sup> .....	\$1,000.. 1 884
Advertising and promotional services <sup>4</sup> .....	\$1,000.. 5 195
Expensed computer hardware and supplies and purchased computer services <sup>4</sup> .....	\$1,000.. 3 150
Refuse removal (including hazardous waste) services <sup>4</sup> .....	\$1,000.. 8 956
Management consulting and administrative services <sup>4</sup> .....	\$1,000.. 11 787
Taxes and license fees <sup>4</sup> .....	\$1,000.. 19 135
All other expenses <sup>4</sup> .....	\$1,000.. 285 077

<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)				
325212, Synthetic rubber manufacturing											
All establishments .....	1	157	9 561	522 068	6 395	12 834	325 130	3 058 793	2 828 597	5 782 311	'284 242
Establishments with—											
1 to 4 employees .....	8	56	114	4 570	76	138	2 831	13 430	20 009	33 170	'588
5 to 9 employees .....	7	18	c	D	D	D	D	D	D	D	D
10 to 19 employees .....	6	21	294	14 054	195	411	8 624	46 740	63 439	110 540	'1 660
20 to 49 employees .....	2	17	573	25 320	377	755	12 871	87 986	91 989	173 014	'67 112
50 to 99 employees .....	—	18	1 215	63 126	780	1 593	34 317	461 526	388 158	843 810	'90 810
100 to 249 employees .....	1	13	1 765	94 904	1 102	2 271	58 913	613 047	572 535	1 202 513	'35 358
250 to 499 employees .....	1	12	4 018	238 805	2 646	5 672	150 386	1 217 850	1 217 227	2 311 986	'60 379
500 to 999 employees .....	—	2	g	D	D	D	D	D	D	D	D
1,000 to 2,499 employees .....	—	—	—	—	—	—	—	—	—	—	—
2,500 employees or more .....	—	—	—	—	—	—	—	—	—	—	—
Administrative records <sup>4</sup> .....	9	25	61	2 733	42	78	1 724	8 711	12 834	20 990	'348

<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)				
325212	Synthetic rubber manufacturing . . . . .	157	9 561	522 068	6 395	12 834	325 130	3 058 793	2 828 597	5 782 311	'284 242
3252120	Synthetic rubber (vulcanizable elastomers) . . . . .	157	9 561	522 068	6 395	12 834	325 130	3 058 793	2 828 597	5 782 311	'284 242

<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)
325212	Synthetic rubber manufacturing . . . . .	2002 . . . . . N 1997 . . . . . N	X X	X X	5 984 702 6 249 385
3252120	Synthetic rubber (vulcanizable elastomers) . . . . .	2002 . . . . . N 1997 . . . . . N	X X	X X	5 984 702 6 249 385
32521201	Styrene-butadiene rubber (SBR), excluding latex . . . . .	2002 . . . . . N 1997 . . . . . N	X X	X X	1 092 691 1 090 752
3252120111	Styrene-butadiene rubber (SBR), excluding latex . . . . . mil lb.	2002 . . . . . 13 1997 . . . . . 7	X X	<sup>q2</sup> 679.4 2 546.0	1 092 691 1 090 752
32521202	Styrene-butadiene rubber (SBR), latex . . . . .	2002 . . . . . N 1997 . . . . . N	X X	X X	616 568 477 767
3252120211	Styrene-butadiene rubber (SBR), latex . . . . . mil lb.	2002 . . . . . 9 1997 . . . . . 8	X X	<sup>q1</sup> 432.7 <sup>q1</sup> 267.2	616 568 477 767
32521203	Butyl, polychloroprene, and stereo polyisoprene elastomers, and nitrile rubber, including latex . . . . .	2002 . . . . . N 1997 . . . . . N	X X	X X	1 031 966 1 116 279
3252120311	Nitrile rubber, including latex . . . . . mil lb.	2002 . . . . . 11 1997 . . . . . 10	X X	S <sup>q</sup> 320.3	275 625 322 523
3252120321	Butyl, polychloroprene, and stereo polyisoprene elastomers, including latex . . . . . mil lb.	2002 . . . . . 8 1997 . . . . . 8	X X	S 805.9	756 341 793 756
32521204	Stereo polybutadiene elastomers, including latex . . . . .	2002 . . . . . N 1997 . . . . . N	X X	X X	582 768 469 844
3252120411	Stereo polybutadiene elastomers, including latex . . . . . mil lb.	2002 . . . . . 3 1997 . . . . . 4	X X	1 177.6 1 045.0	582 768 469 844
32521205	Ethylene-propylene elastomers, including latex . . . . .	2002 . . . . . N 1997 . . . . . N	X X	X X	373 154 639 560
3252120511	Ethylene-propylene elastomers, including latex . . . . . mil lb.	2002 . . . . . 11 1997 . . . . . 11	X X	<sup>p</sup> 538.0 806.1	373 154 639 560
32521206	Silicone elastomers . . . . .	2002 . . . . . N 1997 . . . . . N	X X	X X	565 042 700 350
3252120611	Silicone elastomers . . . . . mil lb.	2002 . . . . . 25 1997 . . . . . 16	X X	S S	565 042 700 350
32521207	Other elastomers, excluding thermoplastic elastomers, including latex . . . . .	2002 . . . . . N 1997 . . . . . N	X X	X X	667 766 492 811
3252120711	Other elastomers, excluding thermoplastic elastomers, including latex . . . . . mil lb.	2002 . . . . . 19 1997 . . . . . 14	X X	S <sup>q</sup> 199.8	667 766 492 811
32521208	Thermoplastics elastomers . . . . .	2002 . . . . . N 1997 . . . . . N	X X	X X	859 265 962 329
3252120811	Thermoplastics elastomers . . . . . mil lb.	2002 . . . . . 16 1997 . . . . . 12	X X	<sup>q</sup> 679.1 <sup>q</sup> 732.9	859 265 962 329
3252120Y	Synthetic rubber (vulcanizable elastomers), nsk, total . . . . .	2002 . . . . . N 1997 . . . . . N	X X	X X	195 482 299 693
3252120YWW	Synthetic rubber (vulcanizable elastomers), nsk, for nonadministrative-record establishments . . . . .	2002 . . . . . N 1997 . . . . . N	X X	X X	177 279 186 315
3252120YWY	Synthetic rubber (vulcanizable elastomers), nsk, for administrative-record establishments . . . . .	2002 . . . . . N 1997 . . . . . N	X X	X X	18 203 113 378

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**

[Not applicable for this report.]

**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)
325212	Synthetic rubber manufacturing		
0090001	Total materials .....	X	2 427 777
	.....2002..	X	2 975 475
	.....1997..		
32519207	Styrene (100 percent basis) .....	890.1	238 273
	..... mil lb. .2002..		
	.....1997..	788.3	209 507
32519205	Phenol (100 percent basis) .....	D	D
	..... mil lb. .2002..	D	D
	.....1997..	D	D
32519229	Other cyclic crudes and intermediates (including melamine, phthalic anhydride, and benzene) .....	X	D
	.....2002..	X	D
	.....1997..		
32519217	Synthetic organic dyes, pigments, lakes, and toners (100 percent basis) .....	9.5	1 264
	..... mil lb. .2002..	D	D
	.....1997..		
32510043	Acrylates and methacrylates, monomers (100 percent basis) .....	144.5	56 160
	..... mil lb. .2002..	115.9	57 029
	.....1997..		
32510037	Alcohols, excluding ethyl (100 percent basis) .....	7.1	2 869
	..... mil lb. .2002..	98.4	1 979
	.....1997..		
32510041	Formaldehyde (100 percent HCHO) .....	.1	22
	..... mil lb. .2002..	D	D
	.....1997..		
32510055	Rubber processing chemicals (accelerators, antioxidants, blowing agents, inhibitors, peptizers, etc.) .....	X	105 833
	.....2002..	X	121 091
	.....1997..		
32510047	Vinyl acetate, monomer (100 percent basis) .....	D	D
	..... mil lb. .2002..	D	D
	.....1997..		
32510049	Vinyl chloride, monomer (100 percent basis) .....	D	D
	..... mil lb. .2002..	D	D
	.....1997..		
325100A3	Other synthetic organic chemicals (including acrylonitrile and cellulose acetate) .....	X	49 653
	.....2002..	X	198 035
	.....1997..		
32411031	Ethane used as a raw material or feedstock .....	D	D
	..... mil lb. .2002..	D	D
	.....1997..		
32411033	Ethylene used as a raw material or feedstock .....	321.2	66 550
	..... mil lb. .2002..		
	.....1997..	P364.0	83 427
32411035	Propane used as a raw material or feedstock .....	D	D
	..... mil lb. .2002..	D	D
	.....1997..		
32411037	Propylene used as a raw material or feedstock .....	164.9	30 476
	..... mil lb. .2002..	S	51 878
	.....1997..		
32411043	Butadiene used as a raw material or feedstock .....	3 083.9	650 997
	..... mil lb. .2002..	P3 128.4	643 084
	.....1997..		
32411045	Other refined petroleum products used as a raw material or feedstock (butane, isobutane, butylene, isobutylene, etc.) .....	D	D
	..... mil lb. .2002..	670.6	237 056
	.....1997..		
00190002	Other hydrocarbons used as raw materials or feedstocks (including crude oil, natural gas and still gas) .....	X	22 912
	.....2002..	X	D
	.....1997..		
32521105	Plastics resins consumed in the form of granules, pellets, powders, liquids, etc. ....	X	91 925
	.....2002..	X	124 349
	.....1997..		
325000B7	Inorganic chemicals .....	X	54 024
	.....2002..	X	71 255
	.....1997..		
32518200	Carbon black .....	147.0	54 241
	..... mil lb. .2002..	S	48 868
	.....1997..		
32500061	All other miscellaneous chemicals (including additives, driers, modifiers, biocides, and dispersants) .....	X	208 792
	.....2002..	X	N
	.....1997..		
32220017	Paper and paperboard containers (including shipping sacks and other paper packaging supplies) .....	X	82 424
	.....2002..	X	41 577
	.....1997..		
00970099	All other materials and components, parts, containers, and supplies .....	X	398 571
	.....2002..	X	666 741
	.....1997..		
00971000	Materials, ingredients, containers, and supplies, nsk .....	X	60 417
	.....2002..	X	220 880
	.....1997..		

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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### **325212 SYNTHETIC RUBBER MANUFACTURING**

This U.S. industry consists of establishments primarily engaged in manufacturing synthetic rubber.

# 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
3251101	3251101	3251101	325188D	325188D	325188D	3252111	3252111	3252111
3251101111	3251101111	3251101111	325188D100	325188D100	325188D000	325211110	325211110	3252111100 pt
3251101121	3251101121	3251101121	325188H	325188G pt	325188G pt	3252111120	3252111120	3252111100 pt
3251101YVW	3251101YVW	3251101YVW	325188H120	325188G120	325188G000 pt	3252111130	3252111130	3252111100 pt
3251104	3251104	3251104	325188H130	325188G130	325188G000 pt	3252111140	3252111140	3252111100 pt
3251104111	3251104111	3251104111	325188HYVW	325188GYVW	325188G000 pt	3252111150	3252111150	3252111100 pt
3251104121	3251104121	3251104121	325188W	325188W pt	325188W pt	3252111160	3252111160	3252111100 pt
3251104YVW	3251104YVW	3251104YVW	325188WYVW	325188WYVW pt	325188WYVW pt	3252111YVW	3252111YVW	3252111100 pt
325110W	325110W	325110W	325188WYVW	325188WYVW pt	325188WYVW pt	3252114	3252114	3252114
325110WYVW	325110WYVW	325110WYVW	325188WYVW	325188WYVW pt	325188WYVW pt	3252114110	3252114110	3252114100 pt
325110WYVY	325110WYVY	325110WYVY	3251910	3251910	3251910	3252114120	3252114120	3252114100 pt
3251201	3251201	3251201	3251910111	3251910111	3251910111	3252114130	3252114130	3252114100 pt
3251201100	3251201100	3251201000	3251910121	3251910121	3251910121	3252114140	3252114140	3252114100 pt
3251204	3251204	3251204	3251910231	3251910231	3251910231	3252114150	3252114150	3252114100 pt
3251204100	3251204100	3251204000	3251910241	3251910241	3251910241	3252114YVW	3252114YVW	3252114100 pt
3251207	3251207	3251207	3251910291	3251910291	3251910291	325211W	325211W	325211W
3251207100	3251207100	3251207000	3251910YVW	3251910YVW	3251910YVW	325211WYVW	325211WYVW	325211WYVW
325120A	325120A	325120A	3251910YVY	3251910YVY	3251910YVY	325211WYVY	325211WYVY	325211WYVY
325120A100	325120A100	325120A000	3251921	3251921	3251921	3252120	3252120	3252120
325120C	325120D	325120D pt	3251921100	3251921100	3251921100	3252120111	3252120111	3252120111
325120C100	325120D100	325120D000 pt	3251924	3251924	3251924	3252120211	3252120211	3252120211
325120G	325120G	325120D pt	3251924100	3251924100	3251924100	3252120311	3252120311	3252120311
325120G100	325120G100	325120D000 pt	325192W	325192W	325192W	3252120321	3252120321	3252120321
325120U	325120U	325120D pt	325192WYVW	325192WYVW	325192WYVW	3252120411	3252120411	3252120411
325120U100	325120U100	325120D000 pt	325192WYVY	325192WYVY	325192WYVY	3252120511	3252120511	3252120511
325120W	325120W	325120W	3251930	3251930	3251930	3252120611	3252120611	3252120611
325120WYVW	325120WYVW	325120WYVW	3251930111	3251930111	3251930111	3252120711	3252120711	3252120711
325120WYVY	325120WYVY	325120WYVY	3251930211	3251930211	3251930211	3252120811	3252120811	3252120811
3251311	3251311	3251311	3251930221	3251930221	3251930221	3252120YVW	3252120YVW	3252120YVW
3251311100	3251311100	3251311000	3251930311	3251930311	3251930311	3252120YVY	3252120YVY	3252120YVY
3251314	3251314	3251314	3251930411	3251930411	3251930411	3252210	3252210	3252210
3251314111	3251314111	3251314111	3251930511	3251930511	3251930511	3252210131	3252210131	3252210131
3251314121	3251314121	3251314121	3251930YVW	3251930YVW	3251930YVW	3252210139 pt	3252210139 pt	3252210111
3251314131	3251314131	3251314131	3251930YVY	3251930YVY	3251930YVY	3252210139 pt	3252210139 pt	3252210121
3251314YVW	3251314YVW	3251314YVW	3251991	3251991	3251991	3252210141	3252210141	3252210141
3251317	3251317	3251317	3251991111	3251991111	3251991111	3252210YVW	3252210YVW	3252210YVW
3251317110	3251317110	3251317110	3251991121	3251991121	3251991121	3252210YVY	3252210YVY	3252210YVY
3251317211	3251317211	3251317211	3251991131	3251991131	3251991131	3252221	3252221	3252221
3251317311	3251317311	3251317311	3251991141	3251991141	3251991141	3252221111	3252221111	3252221111
3251317321	3251317321	3251317321	3251991151	3251991151	3251991151	3252221121	3252221121	3252221121
3251317331	3251317331	3251317331	3251991161	3251991161	3251991161	3252221131	3252221131	3252221131
3251317YVW	3251317YVW	3251317YVW	3251991171	3251991171	3251991171	3252221145 pt	3252221145 pt	3252221141
325131W	325131W	325131W	3251991181	3251991181	3251991181	3252221145 pt	3252221145 pt	3252221151
325131WYVW	325131WYVW	325131WYVW	3251991YVW	3251991YVW	3251991YVW	3252221YVW	3252221YVW	3252221YVW
325131WYVY	325131WYVY	325131WYVY	3251994	3251994	3251994	3252224	3252224	3252224
3251321	3251321	3251321	3251994100	3251994100	3251994100	3252224111	3252224111	3252224111
3251321100	3251321100	3251321100	3251997	3251997	3251997	3252224125 pt	3252224125 pt	3252224121
3251324	3251324	3251324	3251997100	3251997100	3251997100	3252224125 pt	3252224125 pt	3252224131
3251324100	3251324100	3251324100	325199A	325199A	325199A	3252224145 pt	3252224145 pt	3252224141
325132W	325132W	325132W	325199A100	325199A100	325199A100	3252224145 pt	3252224145 pt	3252224151
325132WYVW	325132WYVW	325132WYVW	325199E	325199E	325199E	3252224YVW	3252224YVW	3252224YVW
325132WYVY	325132WYVY	325132WYVY	325199E111	325199E111	325199E111	3252227	3252227	3252227
3251811	3251811	3251811	325199E121	325199E121	325199E121	3252227111	3252227111	3252227111
3251811100	3251811100	3251811000	325199EYVW	325199EYVW	325199EYVW	3252227211	3252227211	3252227211
3251814	3251814	3251814	325199G	325199G	325199U pt	3252227311	3252227311	3252227311
3251814100	3251814100	3251814000	325199G110	325199G110	325199U100 pt	3252227411	3252227411	3252227411
3251817	3251817	3251817	325199G120	325199G120	325199U100 pt	3252227421	3252227421	3252227421
3251817100	3251817100	3251817000	325199G130	325199G130	325199U100 pt	3252227YVW	3252227YVW	3252227YVW
325181W	325181W	325181W	325199G140	325199G140	325199U100 pt	325222A	325222A	325222A
325181WYVW	325181WYVW	325181WYVW	325199G210	325199G210	325199U100 pt	325222A115 pt	325222A115 pt	325222A111
325181WYVY	325181WYVY	325181WYVY	325199GYVW	325199GYVW	325199U100 pt	325222A115 pt	325222A115 pt	325222A121
3251820	3251820	3251820	325199H	325199H	325199H	325222A131	325222A131	325222A131
3251820100	3251820100	3251820100	325199H111	325199H111	325199H111	325222AYVW	325222AYVW	325222AYVW
3251820YVW	3251820YVW	3251820YVW	325199H121	325199H121	325199H121	325222D	325222D	325222D
3251820YVY	3251820YVY	3251820YVY	325199HYVW	325199HYVW	325199HYVW	325222D111	325222D111	325222D111
3251881	3251881	3251881	325199K	325199K	325199K	325222D211	325222D211	325222D211
3251881100	3251881100	3251881000	325199K100	325199K100	325199K100	325222D221	325222D221	325222D221
3251884	3251884	3251884	325199N	325199N	325199N	325222D231	325222D231	325222D231
3251884100	3251884100	3251884000	325199N100	325199N100	325199N100	325222DYVW	325222DYVW	325222DYVW
3251887	3251887	3251887	325199R	325199R	325199R	325222W	325222W	325222W
3251887100	3251887100	3251887000	325199R100	325199R100	325199R100	325222WYVW	325222WYVW	325222WYVW
325188A	325188A	325188A	325199T	325199T	325199T	325222WYVY	325222WYVY	325222WYVY
325188A100	325188A100	325188A000	325199T100	325199T100	325199T100	3253111	3253111	3253111
325199W	325199W	325199W	325199U	325199U	325199U pt	3253111100	3253111100	3253111000
325199W100	325199W100	325199W000	325199U200	325199U200	325199U100 pt	3253114	3253114	3253114
325199WYVW	325199WYVW	325199WYVW	325199V	325199V	325199V	3253114100	3253114100	3253114000
325199WYVY	325199WYVY	325199WYVY	325199Y	325199Y	325199Y	3253117	3253117	3253117
325199YVW	325199YVW	325199YVW	325199Z	325199Z	325199Z	3253117100	3253117100	3253117100
325199YVY	325199YVY	325199YVY	325199Z100	325199Z100	325199Z100	325311W	325311W	325311W
325199YVY	325199YVY	325199YVY	325199Z200	325199Z200	325199Z200	325311WYVW	325311WYVW	325311WYVW
325199YVY	325199YVY	325199YVY	325199Z300	325199Z300	325199Z300	325311WYVY	325311WYVY	325311WYVY
325199YVY	325199YVY	325199YVY	325199Z400	325199Z400	325199Z400	325311WYVY	325311WYVY	325311WYVY
325199YVY	325199YVY	325199YVY	325199Z500	325199Z500	325199Z500	325311WYVY	325311WYVY	325311WYVY
325199YVY	325199YVY	325199YVY	325199Z600	325199Z600	325199Z600	325311WYVY	325311WYVY	325311WYVY
325199YVY	325199YVY	325199YVY						

2002 published	2002 collected	1997 published	2002 published	2002 collected	1997 published	2002 published	2002 collected	1997 published
3253121	3253121	3253121	3254127	3254127	3254127	32552046C1	32552046C1	32552046C1
3253121100	3253121100	3253121000	3254127100	3254127100	3254127000	32552046F1	32552046F1	32552046F1
3253124	3253124	3253124	325412A	325412A	325412A	32552046G1	32552046G1	32552046G1
3253124100	3253124100	3253124000	325412A100	325412A100	325412A000	32552046H1	32552046H1	32552046H1
3253127	3253127	3253127	325412D	325412D	325412D	3255204YVW	3255204YVW	3255204YVW
3253127111	3253127111	3253127111	325412D100	325412D100	325412D000	3255207	3255207	3255207
3253127121	3253127121	3253127121	325412G	325412G	325412G	3255207111	3255207111	3255207111
3253127131	3253127131	3253127131	325412G100	325412G100	325412G000	3255207121	3255207121	3255207121
3253127141	3253127141	3253127141	325412L	325412L	325412L	3255207131	3255207131	3255207131
3253127YVW	3253127YVW	3253127YVW	325412L100	325412L100	325412L000	3255207YVW	3255207YVW	3255207YVW
325312W	325312W	325312W	325412P	325412P	325412P	325520A	325520A	325520A
325312WYVW	325312WYVW	325312WYVW	325412P100	325412P100	325412P000	325520A111	325520A111	325520A111
325312WYVY	325312WYVY	325312WYVY	325412T	325412T	325412T	325520A121	325520A121	325520A121
3253140	3253140	3253140	325412T100	325412T100	325412T000	325520A131	325520A131	325520A131
3253140111	3253140111	3253140111	325412V	325412V	325412V	325520A141	325520A141	325520A141
3253140121	3253140121	3253140121	325412V111	325412V111	325412V111	325520A151	325520A151	325520A151
3253140131	3253140131	3253140131	325412V121	325412V121	325412V121	325520AYVW	325520AYVW	325520AYVW
3253140141	3253140141	3253140141	325412V191	325412V191	325412V191	325520W	325520W	325520W
3253140151	3253140151	3253140151	325412VYVW	325412VYVW	325412VYVW	325520WYVW	325520WYVW	325520WYVW
3253140161	3253140161	3253140161	325412W	325412W	325412W	325520WYVY	325520WYVY	325520WYVY
3253140241	3253140241	3253140241	325412WYVW	325412WYVW	325412WYVW	3256111	3256111	3256111
3253140YVW	3253140YVW	3253140YVW	325412WYVY	325412WYVY	325412WYVY	3256111111	3256111111	3256111111
3253140YVY	3253140YVY	3253140YVY	3254130	3254130	3254130	3256111121	3256111121	3256111121
3253201	3253201	3253201	32541301011	32541301011	3254130111	3256111131	3256111131	3256111131
3253201111	3253201111	3253201111	3254130221	3254130221	3254130221	3256111211	3256111211	3256111211
3253201413	3253201413	3253201413	3254130331	3254130331	3254130331	3256111321	3256111321	3256111321
3253201725	3253201725	3253201725	3254130341	3254130341	3254130341	3256111411	3256111411	3256111411
3253201A15	3253201A15	3253201A15	3254130351	3254130351	3254130351	3256111511	3256111511	3256111511
3253201A17	3253201A17	3253201A17	3254130461	3254130461	3254130461	3256111611	3256111611	3256111611
3253201A21	3253201A21	3253201A21	3254130571	3254130571	3254130571	3256111711	3256111711	3256111711
3253201A23	3253201A23	3253201A23	3254130691	3254130691	3254130691	3256111721	3256111721	3256111721
3253201A27	3253201A27	3253201A27	3254130YVW	3254130YVW	3254130YVW	3256111731	3256111731	3256111731
3253201A29	3253201A29	3253201A29	3254130YVY	3254130YVY	3254130YVY	3256111741	3256111741	3256111741
3253201A41	3253201A41	3253201A41	3254141	3254141	3254141	3256111YVW	3256111YVW	3256111YVW
3253201A43	3253201A43	3253201A43	3254141111	3254141111	3254141111	3256114	3256114	3256114
3253201A45	3253201A45	3253201A45	3254141121	3254141121	3254141121	3256114111	3256114111	3256114111
3253201A47	3253201A47	3253201A47	3254141YVW	3254141YVW	3254141YVW	3256114121	3256114121	3256114121
3253201D31	3253201D31	3253201D31	3254144	3254144	3254144	3256114211	3256114211	3256114211
3253201D33	3253201D33	3253201D33	3254144100	3254144100	3254144100	3256114311	3256114311	3256114311
3253201YVW	3253201YVW	3253201YVW	3254147	3254147	3254147	3256114411	3256114411	3256114411
3253204	3253204	3253204	3254147111	3254147111	3254147111	3256114511	3256114511	3256114511
3253204111	3253204111	3253204111	3254147121	3254147121	3254147121	3256114521	3256114521	3256114521
3253204113	3253204113	3253204113	3254147YVW	3254147YVW	3254147YVW	3256114531	3256114531	3256114531
3253204115	3253204115	3253204115	325414A pt	325414A pt	325414A	3256114541	3256114541	3256114541
3253204117	3253204117	3253204117	325414A111	325414A111	325414A111	3256114551	3256114551	3256114551
3253204121	3253204121	3253204121	325414A121	325414A121	325414A121	3256114561	3256114561	3256114561
3253204123	3253204123	3253204123	325414A131	325414A131	325414A131	3256114571	3256114571	3256114571
3253204125	3253204125	3253204125	325414A21	325414A21	325414A21	3256114581	3256114581	3256114581
3253204127	3253204127	3253204127	325414A31	325414A31	325414A31	3256114591	3256114591	3256114591
3253204129	3253204129	3253204129	325414AYVW	325414AYVW	325414AYVW pt	3256114YVW	3256114YVW	3256114YVW
3253204131	3253204131	3253204131	325414W	325414W	325414W pt	3256117	3256117	3256117
3253204133	3253204133	3253204133	325414WYVW	325414WYVW	325414WYVW pt	3256117111	3256117111	3256117111
3253204141	3253204141	3253204141	325414WYVY	325414WYVY	325414WYVY pt	3256117211	3256117211	3256117211
3253204143	3253204143	3253204143	3255101	3255101	3255101	3256117311	3256117311	3256117311
3253204145	3253204145	3253204145	3255101100	3255101100	3255101000	3256117321	3256117321	3256117321
3253204147	3253204147	3253204147	3255104	3255104	3255104000	3256117331	3256117331	3256117331
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3253207	3253207	3253207	3255107	3255107	3255107000	3256117YVW	3256117YVW	3256117YVW
3253207111	3253207111	3253207111	325510B pt	325510B pt	325510B	325611A	325611A	325611A
3253207113	3253207113	3253207113	325510B100 pt	325510B100 pt	325510B000	325611A111	325611A111	325611A111
3253207121	3253207121	3253207121	325510B100 pt	325510B100 pt	325510B000	325611A121	325611A121	325611A121
3253207123	3253207123	3253207123	325510W pt	325510W pt	325510W	325611AYVW	325611AYVW	325611AYVW
3253207125	3253207125	3253207125	325510W pt	325510W pt	325510W	325611D	325611D	325611D
3253207131	3253207131	3253207131	325510W pt	325510W pt	325510W	325611D100	325611D100	325611D100
3253207133	3253207133	3253207133	325510W pt	325510W pt	325510W	325611W	325611W	325611W
3253207135	3253207135	3253207135	325510W pt	325510W pt	325510W	325611WYVW	325611WYVW	325611WYVW
3253207137	3253207137	3253207137	325510W pt	325510W pt	325510W	325611WYVY	325611WYVY	325611WYVY
3253207141	3253207141	3253207141	325510W pt	325510W pt	325510W	3256121	3256121	3256121
3253207143	3253207143	3253207143	325510W pt	325510W pt	325510W	3256121111	3256121111	3256121111
3253207145	3253207145	3253207145	325510W pt	325510W pt	325510W	3256121121	3256121121	3256121121
3253207151	3253207151	3253207151	325510W pt	325510W pt	325510W	3256121131	3256121131	3256121131
3253207155	3253207155	3253207155	325510W pt	325510W pt	325510W	3256121141	3256121141	3256121141
3253207157	3253207157	3253207157	325510W pt	325510W pt	325510W	3256121YVW	3256121YVW	3256121YVW
3253207159	3253207159	3253207159	325510W pt	325510W pt	325510W	3256125	3256125	3256125
3253207YVW	3253207YVW	3253207YVW	325510WYVW pt	325510WYVW pt	325510WYVW	325612511	325612511	325612511
325320W	325320W	325320W	325510WYVY pt	325510WYVY pt	325510WYVY	325612521	325612521	325612521
325320WYVW	325320WYVW	325320WYVW	325510WYVY pt	325510WYVY pt	325510WYVY	3256125221	3256125221	3256125221
325320WYVY	325320WYVY	325320WYVY	325510WYVY pt	325510WYVY pt	325510WYVY	3256125231	3256125231	3256125231
3254111	3254111	3254111	325510WYVY pt	325510WYVY pt	325510WYVY	3256125241	3256125241	3256125241
3254111111	3254111111	3254111111	325510WYVY pt	325510WYVY pt	325510WYVY	3256125251	3256125251	3256125251
3254111221	3254111221	3254111221	325510WYVY pt	325510WYVY pt	325510WYVY	3256125261	3256125261	3256125261
3254111YVW	3254111YVW	3254111YVW	325510WYVY pt	325510WYVY pt	325510WYVY	3256125271	3256125271	3256125271
3254114	3254114	3254114	325510WYVY pt	325510WYVY pt	325510WYVY	3256125281	3256125281	3256125281
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2002 published	2002 collected	1997 published	2002 published	2002 collected	1997 published	2002 published	2002 collected	1997 published
3256127	3256127	3256127	325620G231	325620G231	325620G231	3259921YVW	3259921YVW	3259921YVW
3256127111	3256127111	3256127111	325620G311	325620G311	325620G311	3259923101	3259923101	3259923101
3256127121	3256127121	3256127121	325620G321	325620G321	325620G321	3259923106	3259923106	3259923106
3256127131	3256127131	3256127131	325620G331	325620G331	325620G331	3259923111	3259923111	3259923111
3256127141	3256127141	3256127141	325620G341	325620G341	325620G341	3259923YVW	3259923YVW	3259923YVW
3256127151	3256127151	3256127151	325620G351	325620G351	325620G351	3259925	3259925	3259925
3256127161	3256127161	3256127161	325620G361	325620G361	325620G361	3259925101	3259925101	3259925101
3256127171	3256127171	3256127171	325620G371	325620G371	325620G371	3259925206	3259925206	3259925206
3256127181	3256127181	3256127181	325620G381	325620G381	325620G381	3259925316	3259925316	3259925316
3256127191	3256127191	3256127191	325620G391	325620G391	325620G391	3259925321	3259925321	3259925321
32561271A1	32561271A1	32561271A1	325620G3A1	325620G3A1	325620G3A1	3259925YVW	3259925YVW	3259925YVW
32561271B1	32561271B1	32561271B1	325620G3B1	325620G3B1	325620G3B1	325992W	325992W	325992W
3256127YVW	3256127YVW	3256127YVW	325620GYVW	325620GYVW	325620GYVW	325992WYVW	325992WYVW	325992WYVW
325612W	325612W pt	325612W pt	325620W	325620W	325620W	325992WYVW	325992WYVW	325992WYVW
325612WYVW	325612WYVW pt	325612WYVW pt	325620WYVW	325620WYVW	325620WYVW	325992WYVW	325992WYVW	325992WYVW
325612WYVW	325612WYVW pt	325612WYVW pt	325620WYVW	325620WYVW	325620WYVW	3259981	3259981	3259981
3256130	3256130	3256130	3259101	3259101	3259101	3259981100	3259981100	3259981100
3256130111	3256130111	3256130111	3259101111	3259101111	3259101111	3259984	3259984	3259984
3256130121	3256130121	3256130121	3259101121	3259101121	3259101121	3259984100	3259984100	3259984100
3256130131	3256130131	3256130131	3259101131	3259101131	3259101131	3259987	3259987	3259987
3256130241	3256130241	3256130241	3259101YVW	3259101YVW	3259101YVW	3259987111	3259987111	3259987111
3256130YVW	3256130YVW	3256130YVW	3259104	3259104	3259104	3259987121	3259987121	3259987121
3256130YVW	3256130YVW	3256130YVW	3259104111	3259104111	3259104111	3259987131	3259987131	3259987131
3256201	3256201	3256201	3259104221	3259104221	3259104221	3259987YVW	3259987YVW	3259987YVW
3256201111	3256201111	3256201111	3259104341	3259104341	3259104341	325998A	325998A	325998A
3256201121	3256201121	3256201121	3259104431	3259104431	3259104431	325998A111	325998A111	325998A111
3256201131	3256201131	3256201131	3259104451	3259104451	3259104451	325998A121	325998A121	325998A121
3256201YVW	3256201YVW	3256201YVW	3259104YVW	3259104YVW	3259104YVW	325998A131	325998A131	325998A131
3256204	3256204	3256204	3259107	3259107	3259107	325998A141	325998A141	325998A141
3256204111	3256204111	3256204111	3259107131	3259107131	3259107131	325998AYVW	325998AYVW	325998AYVW
3256204121	3256204121	3256204121	3259107141	3259107141	3259107141	325998E	325998E	325998E
3256204131	3256204131	3256204131	3259107211	3259107211	3259107211	325998E111	325998E111	325998E111
3256204211	3256204211	3256204211	3259107221	3259107221	3259107221	325998E121	325998E121	325998E121
3256204YVW	3256204YVW	3256204YVW	3259107251	3259107251	3259107251	325998E131	325998E131	325998E131
3256207	3256207	3256207	3259107YVW	3259107YVW	3259107YVW	325998E141	325998E141	325998E141
3256207111	3256207111	3256207111	325910A	325910A	325910A	325998E151	325998E151	325998E151
3256207121	3256207121	3256207121	325910A111	325910A111	325910A111	325998E161	325998E161	325998E161
3256207131	3256207131	3256207131	325910A121	325910A121	325910A121	325998E171	325998E171	325998E171
3256207141	3256207141	3256207141	325910A131	325910A131	325910A131	325998E181	325998E181	325998E181
3256207151	3256207151	3256207151	325910A141	325910A141	325910A141	325998E191	325998E191	325998E191
3256207211	3256207211	3256207211	325910AYVW	325910AYVW	325910AYVW	325998E1A1	325998E1A1	325998E1A1
3256207221	3256207221	3256207221	325910E	325910E	325910E	325998EYVW	325998EYVW	325998EYVW
3256207231	3256207231	3256207231	325910E111	325910E111	325910E111	325998J pt	325998J pt	325998J pt
3256207241	3256207241	3256207241	325910E121	325910E121	325910E121	325998J101	325998J101	325998J101
3256207251	3256207251	3256207251	325910E131	325910E131	325910E131	325998J103	325998J103	325998J103
3256207261	3256207261	3256207261	325910EYVW	325910EYVW	325910EYVW	325998J106	325998J106	325998J106
3256207271	3256207271	3256207271	325910H	325910H	325910H	325998J107	325998J107	325998J107
3256207281	3256207281	3256207281	325910H111	325910H111	325910H111	325998J109	325998J109	325998J109
3256207291	3256207291	3256207291	325910H121	325910H121	325910H121	325998J111	325998J111	325998J111
32562072A1	32562072A1	32562072A1	325910H131	325910H131	325910H131	325998J121	325998J121	325998J121
32562072B1	32562072B1	32562072B1	325910HYVW	325910HYVW	325910HYVW	325998J131	325998J131	325998J131
32562072C1	32562072C1	32562072C1	325910W	325910W	325910W	325998J141	325998J141	325998J141
32562072D1	32562072D1	32562072D1	325910WYVW	325910WYVW	325910WYVW	325998J151	325998J151	325998J151
3256207YVW	3256207YVW	3256207YVW	325910WYVW	325910WYVW	325910WYVW	325998J161	325998J161	325998J161
325620A	325620A	325620A	3259200	3259200	3259200	325998J171	325998J171	325998J171
325620A111	325620A111	325620A111	3259200111	3259200111	3259200111	325998J181	325998J181	325998J181
325620A121	325620A121	325620A121	3259200121	3259200121	3259200121	325998J191	325998J191	325998J191
325620AYVW	325620AYVW	325620AYVW	3259200231	3259200231	3259200231	325998J1A1	325998J1A1	325998J1A1
325620D	325620D	325620D	3259200341	3259200341	3259200341	325998J1B1	325998J1B1	325998J1B1
325620D111	325620D111	325620D111	3259200YVW	3259200YVW	3259200YVW	325998J1C1	325998J1C1	325998J1C1
325620D121	325620D121	325620D121	3259200YVW	3259200YVW	3259200YVW	325998J1D1	325998J1D1	325998J1D1
325620D131	325620D131	325620D131	3259200YVW	3259200YVW	3259200YVW	325998J1F1	32561244H1	32561244H1
325620D141	325620D141	325620D141	3259911	3259911	3259911	325998J1G1	325998H1G1	325998H1G1 pt
325620D151	325620D151	325620D151	3259911115	3259911115	3259911115	325998J1H1	325998H1H1	325998H1H1 pt
325620D211	325620D211	325620D211	3259911221	3259911221	3259911221	325998J1U1	325998H1U1	325998H1U1 pt
325620D221	325620D221	325620D221	3259911YVW	3259911YVW	3259911YVW	325998JYVW pt	3256124YVW pt	3256124YVW pt
325620D231	325620D231	325620D231	3259912	3259912	3259912	325998JYVW pt	325998HYVW pt	325998HYVW pt
325620D241	325620D241	325620D241	3259912100	3259912100	3259912100	325998W pt	325612W pt	325612W pt
325620D251	325620D251	325620D251	325991W	325991W	325991W	325998W pt	325998W pt	325998W pt
325620D261	325620D261	325620D261	325991WYVW	325991WYVW	325991WYVW	325998WYVW pt	325612WYVW pt	325612WYVW pt
325620D271	325620D271	325620D271	3259921	3259921	3259921	325998WYVW pt	325998WYVW pt	325998WYVW pt
325620DYVW	325620DYVW	325620DYVW	3259921101	3259921101	3259921101	325998WYVW pt	325612WYVW pt	325612WYVW pt
325620G	325620G	325620G	3259921106	3259921106	3259921106	325998WYVW pt	325612WYVW pt	325612WYVW pt
325620G111	325620G111	325620G111	3259921111	3259921111	3259921111	325998WYVW pt	325612WYVW pt	325612WYVW pt
325620G121	325620G121	325620G121	3259921116	3259921116	3259921116	325998WYVW pt	325998WYVW pt	325998WYVW pt
325620G131	325620G131	325620G131						
325620G211	325620G211	325620G211						
325620G221	325620G221	325620G221						

