

Plastics Pipe and Pipe Fitting Manufacturing

1997

Issued September 1999

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1997 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
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-- Not applicable for this report.

Introduction to the Economic Census

PURPOSES AND USES OF THE ECONOMIC CENSUS

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

ALL-NEW INDUSTRY CLASSIFICATIONS

Data from the 1997 Economic Census are published primarily on the basis of the North American Industry Classification System (NAICS), unlike earlier censuses, which were published according to the Standard Industrial Classification (SIC) system. NAICS is in the process of being adopted in the United States, Canada, and Mexico. Most economic census reports cover one of 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 Foodservices
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), covered by the census of governments conducted by the Census Bureau.)

The 20 NAICS sectors are subdivided into 96 subsectors (three-digit codes), 313 industry groups (four-digit codes), and, as implemented in the United States, 1170 industries (five- and six-digit codes).

RELATIONSHIP TO SIC

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 industry definitions discuss the relationships between NAICS and SIC industries. Where changes are significant, it will not be possible to construct time series that include data for points both before and after 1997.

For 1997, data for auxiliary establishments (those functioning primarily to manage, service, or support the activities of their company's operating establishments, such as a central administrative office or warehouse) will not be included in the sector-specific reports. These data will be published separately.

GEOGRAPHIC AREA CODING

Accurate and complete information on the physical location of each establishment is required to tabulate the census data for the states, metropolitan areas (MAs), counties, parishes, and corporate municipalities including cities, towns, 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 Internal Revenue Service tax forms is used as a basis for coding.

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.

DOLLAR VALUES

All dollar values presented are expressed in current dollars; i.e., 1997 data are expressed in 1997 dollars, and 1992 data, in 1992 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.

AVAILABILITY OF ADDITIONAL DATA

Reports in Print and Electronic Media

All results of the 1997 Economic Census are available on the Census Bureau Internet site (www.census.gov) and on compact discs (CD-ROM) for sale by the Census Bureau. Unlike previous censuses, only selected highlights are published in printed reports. For more information, including a description of electronic and printed reports being issued, see the Internet site, or write to U.S. Census Bureau, Washington, DC 20233-8300, or call Customer Services at 301-457-4100.

Special Tabulations

Special tabulations of data collected in the 1997 Economic Census may be obtained, depending on availability of time and personnel, in electronic or tabular form. The data will be summaries subject to the same rules prohibiting disclosure of confidential information (including name, address, kind of business, or other data for individual business establishments or companies) that govern the regular publications.

Special tabulations are prepared on a cost basis. A request for a cost estimate, as well as exact specifications on the type and format of the data to be provided, should be directed to the Chief of the division named below, U.S. Census Bureau, Washington, DC 20233-8300. To discuss a special tabulation before submitting specifications, call the appropriate division:

Manufacturing and Construction Division 301-457-4673
Service Sector Statistics Division 301-457-2668

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 from the regular decennial population census. Censuses covering retail and wholesale trade and construction industries were added in 1930, as were some covering service trades in 1933. Censuses of construction, manufacturing, and the other business service 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, using consistent time periods, concepts, definitions, classifications, and reporting units. It was the first census to be taken by mail, using lists of firms provided by the administrative records of other Federal agencies. Since 1963, administrative records also have been used to provide basic statistics for very small firms, reducing or eliminating the need to send them census questionnaires.

The range of industries covered in the economic censuses expanded between 1967 and 1992. 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.

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. All of the census reports printed since 1967 are still available for sale on microfiche from the Census Bureau. CD-ROMs issued from the 1987 and 1992 Economic Censuses contain databases including 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 each of the economic censuses and related surveys is published in the *Guide to the 1997 Economic Census and Related Statistics* at www.census.gov/econguide. More information on the methodology, procedures, and history of the censuses will be published in the *History of the 1997 Economic Census* at www.census.gov/econ/www/history.html.

ABBREVIATIONS AND SYMBOLS

The following abbreviations and symbols are used with the 1997 Economic Census 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.
Q	Revenue not collected at this level of detail for multiestablishment firms.
S	Withheld because estimates did not meet publication standards.

V	Represents less than 50 vehicles or .05 percent.
X	Not applicable.
Y	Disclosure withheld because of insufficient coverage of merchandise lines.
Z	Less than half the unit shown.
a	0 to 19 employees.
b	20 to 99 employees.
c	100 to 249 employees.
e	250 to 499 employees.
f	500 to 999 employees.
g	1,000 to 2,499 employees.
h	2,500 to 4,999 employees.
i	5,000 to 9,999 employees.
j	10,000 to 24,999 employees.
k	25,000 to 49,999 employees.
l	50,000 to 99,999 employees.
m	100,000 employees or more.
p	10 to 19 percent estimated.
q	20 to 29 percent estimated.
r	Revised.
s	Sampling error exceeds 40 percent.
nec	Not elsewhere classified.
nsk	Not specified by kind.
–	Represents zero (page image/print only).
(CC)	Consolidated city.
(IC)	Independent city.

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Manufacturing

SCOPE

The 1997 Economic Census – Manufacturing covers all manufacturing establishments with one or more paid employees. Manufacturing is defined as the mechanical, physical, or chemical transformation of materials or substances into new products. The assembly of components into new products is also considered manufacturing, except when it is appropriately classified as construction.

Establishments in the manufacturing sector are often described as plants, factories, or mills and typically use power-driven machines and materials-handling equipment. Also included in the manufacturing sector are some establishments that make products by hand, like custom tailors and the makers of custom draperies. While manufacturers typically do not sell to the public, some establishments like bakeries and candy stores that make products on the premises may be included.

GENERAL

This report, from the 1997 Economic Census – Manufacturing, is one of a series of 480 industry reports and 51 geographic area reports, each of which provides statistics for individual industries or states, respectively. Seven of the industry reports are for industries no longer in the manufacturing sector but are included with manufacturing for the 1997 census year. Also included for this sector are General, Product, and Materials Consumed Summary reports, a special report on Concentration Ratios in Manufacturing, and data files on Location of Manufacturing Plants.

Each industry report presents data for a six-digit North American Industry Classification System (NAICS) industry. A description of the particular NAICS industry may be found in Appendix B. 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. Explanations of these and other terms may be found in Appendix A. The industry reports also include data for states with 100 employees or more in the industry.

State reports, which include the District of Columbia, present similar statistics at the “all manufacturing” level for each state and its metropolitan areas (MAs) 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.

The General Summary 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.

The Products and Materials Consumed reports summarize the products and materials data published in the industry reports. The Product Summary report also includes data from the Current Industrial Reports (CIR) and a special table with data for products that are primary to more than one industry, which are not in the industry reports.

The Concentration Ratios report publishes data on the percentage of value of shipments accounted for by the 4-, 8-, 20-, and 50-largest companies for each manufacturing industry. Also shown in this report are Hirschmann-Herfindahl Indexes for each industry.

The Location of Manufacturing data files contain 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.

GEOGRAPHIC AREAS COVERED

Statistics at the six-digit NAICS industry level are shown for states and the District of Columbia in both the state and industry reports for cells with 100 employees or more.

The state reports also include data at the “all manufacturing” level for a variety of geographies that meet the employment criteria.

Data are available for the metropolitan areas (MAs) with 250 employees or more. The term MA is a general term used to encompass all of the specifically defined metropolitan areas. A consolidated metropolitan statistical area (CMSA) is made up of two or more contiguous primary metropolitan statistical areas (PMSAs) with a combined population of at least 1 million. A PMSA is a subdivision of a CMSA that demonstrates very strong internal economic and social links separate from the ties to other portions of the CMSA. A metropolitan statistical area (MSA) is an integrated economic and social unit with a population of at least 50,000. An MA is made up of one or more counties meeting standards of metropolitan character. In New England, cities and towns, rather than counties, are the component geographic units. Determination of the MAs was made by the Office of Management and Budget (OMB) as of June 30, 1997. The population estimates were from the 1990 Census of Population or a subsequent special

census. When applicable, the make-up of an MA is included in Appendix E. Changes to geographical boundaries are noted in Appendix D.

The state reports include data for counties with 500 employees or more. These are the primary divisions of states, except in Louisiana where they are called parishes and in Alaska where they are called boroughs and census areas. Maryland, Missouri, Nevada, and Virginia have one or more places that are independent of county organizations. These places are treated as counties and places. The counties and places are defined as of January 1, 1997.

The state reports include data for places with 500 employees or more. Places are typically cities, towns, and villages. They may be incorporated municipalities, semi-independent municipalities, special economic urban areas (SEUAs), or other place equivalents.

The state reports also include data for consolidated cities with 500 employees or more. Consolidated cities are made up of separately incorporated municipalities.

COMPARABILITY OF THE 1992 AND 1997 CENSUSES

The adoption of the North American Industry Classification System (NAICS) has had a major impact on the comparability of data between the 1992 and 1997 censuses. Approximately half of the industries in the manufacturing sector of NAICS do not have comparable industries in the Standard Industrial Classification (SIC) system that was used in the past. If industries are not comparable between the two censuses, historic data are not shown. When applicable, Appendix G shows the product class and product comparability between the two systems.

While most of the change affecting the manufacturing sector was change within the sector, some industries left manufacturing and others came into manufacturing. Prominent among those leaving manufacturing are logging and portions of publishing. Prominent among the industries coming into the manufacturing sector are bakeries, candy stores where candy is made on the premises, custom tailors, makers of custom draperies, and tire retreading. Data for the industries coming into manufacturing as well as those leaving manufacturing are included in the manufacturing industry report series for 1997. However, the state and summary reports only include data for industries in the NAICS definition of manufacturing.

Another change resulting from the conversion to NAICS is that data for central administrative offices (CAOs) associated with manufacturing are not included along side the

manufacturing data. This change affects data in the state reports and the general summary.

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 classified in a specific industry or geography is not considered a disclosure, and may be released even when other information is withheld.

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. However, the suppressed data are included in higher-level totals. A separate disclosure analysis is performed for capital expenditures that 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 58,000 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 a Current Industrial Reports (CIR) program. The CIR publishes detailed product statistics for selected manufacturing industries at the U.S. level annually and, in some cases, monthly and/or quarterly. For the 1997 Economic Census – Manufacturing, the annual CIR data are included in the Product Summary report.

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.

Table 1. Industry Statistics on NAICS Basis With Distribution Among 1987 SIC-Based Industries: 1997

[NAICS codes appear in bold type. For meaning of abbreviations and symbols, see introductory text. For explanation of terms, see appendixes]

NAICS or SIC code	Industry	Com-panies ¹	All estab-lish-ments ²	All employees		Production workers			Value added by manufacture (\$1,000)	Cost of materials (\$1,000)	Value of shipments (\$1,000)	Total capital expendi-tures (\$1,000)
				Number	Payroll (\$1,000)	Number	Hours (1,000)	Wages (\$1,000)				
326122	Plastics pipe & pipe fitting mfg.	315	441	19 685	542 113	15 482	30 437	363 104	1 756 200	3 042 244	4 744 625	240 999
308400	Plastics pipe.....	N	349	15 627	441 144	12 261	24 105	295 054	1 444 526	2 780 976	4 177 333	201 532
308910	Plastics products, n.e.c. (pt) ...	N	92	4 058	100 969	3 221	6 332	68 050	311 674	261 268	567 292	39 467

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

²Includes establishments with payroll at any time during the year.

Table 2. Industry Statistics for Selected States: 1997

[States that are disclosures or with less than 100 employees are not shown. For explanation of terms, see appendixes. For meaning of abbreviations and symbols, see introductory text]

Industry and geographic area	E ¹	All establishments		All employees		Production workers			Value added by manufacture (\$1,000)	Cost of materials (\$1,000)	Value of shipments (\$1,000)	Total capital expendi-tures (\$1,000)
		Total	With 20 em-ploy-ees or more	Number	Payroll (\$1,000)	Number	Hours (1,000)	Wages (\$1,000)				
326122, PLASTICS PIPE & PIPE FITTING MFG												
United States	1	441	260	19 685	542 113	15 482	30 437	363 104	1 756 200	3 042 244	4 744 625	240 999
Alabama	1	16	12	594	14 249	493	899	9 926	39 205	53 511	90 430	1 774
Arizona	3	3	3	192	5 619	168	382	4 512	19 322	38 259	57 437	1 867
California	-	46	24	2 035	59 014	1 522	2 769	34 966	184 669	288 640	468 865	30 126
Colorado	-	8	3	160	4 951	136	267	3 522	26 718	59 896	85 853	1 854
Florida	1	28	17	942	23 155	768	1 339	16 549	64 615	135 135	198 237	6 898
Georgia	-	17	10	711	21 922	555	1 107	13 163	99 307	143 509	239 253	10 354
Illinois	1	15	11	482	12 316	358	700	9 039	35 222	72 839	107 426	2 786
Indiana	1	15	12	927	23 704	752	1 478	16 891	99 908	128 414	225 314	16 167
Iowa	-	12	7	446	12 191	335	669	8 377	44 187	81 342	126 018	2 918
Kansas	1	11	7	489	11 885	385	696	8 826	41 207	60 981	103 058	4 375
Kentucky	-	7	6	466	11 968	369	786	9 088	43 205	100 734	142 768	5 600
Massachusetts	-	6	2	118	3 670	75	165	1 715	10 161	21 680	32 510	3 618
Michigan	2	14	4	369	8 897	251	466	5 877	29 688	47 170	78 508	6 501
Minnesota	-	7	4	385	10 341	319	594	6 911	41 459	54 599	95 929	2 561
Missouri	-	7	3	147	4 114	114	259	3 122	8 693	29 975	38 432	2 148
Nebraska	-	8	4	391	11 252	281	655	7 050	31 693	68 912	97 594	2 184
Nevada	-	5	4	188	4 937	141	306	3 657	18 960	58 623	76 690	1 046
New Jersey	4	8	5	250	7 064	177	333	3 829	16 833	22 707	39 393	1 237
New York	-	10	6	611	16 472	500	889	9 978	57 540	68 339	123 495	4 962
North Carolina	-	9	9	1 199	35 512	1 023	2 005	26 153	114 210	221 395	318 519	26 131
Ohio	1	27	15	1 524	44 405	1 203	2 455	29 570	118 190	148 130	265 815	16 772
Oklahoma	2	10	6	541	15 457	445	968	11 766	50 946	52 903	103 964	4 165
Oregon	-	9	5	326	9 509	260	528	7 075	29 511	71 449	101 557	3 776
Pennsylvania	-	15	11	783	25 597	591	1 273	15 388	103 925	189 208	288 230	9 237
South Carolina	-	4	4	310	8 308	254	490	6 293	36 788	70 801	106 501	2 697
Tennessee	-	8	4	568	18 151	439	1 002	12 912	25 835	52 176	78 246	4 546
Texas	-	40	25	1 779	50 940	1 422	2 861	32 508	147 232	321 225	464 406	21 639
Virginia	-	5	3	309	7 502	233	438	4 689	23 427	26 111	47 447	1 552
Washington	1	10	5	314	10 265	236	456	7 061	28 207	53 626	85 284	2 583
Wisconsin	-	7	2	264	8 164	206	421	5 550	22 258	45 464	66 704	2 708

* Hawaii has no incorporated places in the sense of functioning governmental units; however, in agreement with Hawaiian law, the Bureau of the Census reports data for census designated places (CDPs) which have been designated as place equivalents. Those CDPs, only for the state of Hawaii, with 2,500 or more population are recognized.

¹Some 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 based on administrative-record 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.

Table 3. Detailed Statistics by Industry: 1997

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

Item	Value	Item	Value
326122, PLASTICS PIPE & PIPE FITTING MFG		326122, PLASTICS PIPE & PIPE FITTING MFG— Con.	
Companies ¹	number.. 315	Value added	\$1,000.. 1 756 200
All establishments	number.. 441	Total inventories, beginning of year	\$1,000.. 677 804
Establishments with 1 to 19 employees	number.. 181	Finished goods inventories, beginning of year	\$1,000.. 444 886
Establishments with 20 to 99 employees	number.. 214	Work-in-process inventories, beginning of year	\$1,000.. 29 115
Establishments with 100 employees or more	number.. 46	Materials and supplies inventories, beginning of year	\$1,000.. 203 803
All employees	number.. 19 685	Total inventories, end of year	\$1,000.. 772 644
Total compensation ²	\$1,000.. 676 241	Finished goods inventories, end of year	\$1,000.. 489 306
Annual payroll	\$1,000.. 542 113	Work-in-process inventories, end of year	\$1,000.. 38 514
Total fringe benefits	\$1,000.. 134 128	Materials and supplies inventories, end of year	\$1,000.. 244 824
Production workers, average for year	number.. 15 482	Gross book value of total assets at beginning of year	\$1,000.. 1 446 183
Production workers on March 12	number.. 15 148	Total capital expenditures (new and used)	\$1,000.. 240 999
Production workers on May 12	number.. 15 735	Capital expenditures for buildings and other structures (new and used)	\$1,000.. 29 536
Production workers on August 12	number.. 15 597	Capital expenditures for machinery and equipment (new and used)	\$1,000.. 211 463
Production workers on November 12	number.. 15 448	Total retirements ²	\$1,000.. 35 121
Production-worker hours	\$1,000.. 30 437	Gross book value of total assets at end of year	\$1,000.. 1 652 061
Production-worker wages	\$1,000.. 363 104	Total depreciation during year ²	\$1,000.. 106 462
Total cost of materials	\$1,000.. 3 042 244	Total rental payments ²	\$1,000.. 30 858
Cost of materials, parts, containers, etc., consumed	\$1,000.. 2 834 308	Buildings and other structures rental payments ²	\$1,000.. 14 864
Cost of resales	\$1,000.. 80 115	Machinery and equipment rental payments ²	\$1,000.. 15 994
Cost of fuels	\$1,000.. 6 737	Cost of purchased services for the repair of buildings and other structures ³	\$1,000.. 3 769
Cost of purchased electricity	\$1,000.. 110 929	Response coverage ratio ⁴	percent.. 82
Cost of contract work	\$1,000.. 10 155	Cost of purchased services for the repair of machinery and equipment ³	\$1,000.. 49 111
Quantity of electricity purchased for heat and power	1,000 kWh.. 2 066 163	Response coverage ratio ⁴	percent.. 82
Quantity of electricity generated less sold for heat and power	1,000 kWh.. —	Cost of purchased communications services ³	\$1,000.. 7 786
Total value of shipments	\$1,000.. 4 744 625	Response coverage ratio ⁴	percent.. 82
Primary products value of shipments	\$1,000.. 4 522 374	Cost of purchased legal services ³	\$1,000.. 7 064
Secondary products value of shipments	\$1,000.. 116 773	Response coverage ratio ⁴	percent.. 82
Total miscellaneous receipts	\$1,000.. 105 478	Cost of purchased accounting and bookkeeping services ³	\$1,000.. 3 034
Value of resales	\$1,000.. 101 431	Response coverage ratio ⁴	percent.. 82
Contract receipts	\$1,000.. 2 027	Cost of purchased advertising services ³	\$1,000.. 9 412
Other miscellaneous receipts	\$1,000.. 2 020	Response coverage ratio ⁴	percent.. 82
Primary products specialization ratio	percent.. 97	Cost of purchased software and other data processing services ³	\$1,000.. 3 133
Value of primary products shipments made in all industries	\$1,000.. 4 739 816	Response coverage ratio ⁴	percent.. 82
Value of primary products shipments made in this industry	\$1,000.. 4 522 374	Cost of purchased refuse removal (including hazardous waste) services ³	\$1,000.. 2 563
Value of primary products shipments made in other industries	\$1,000.. 217 442	Response coverage ratio ⁴	percent.. 82
Coverage ratio	percent.. 95		

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

²These items are collected in the ASM and estimated for the remaining establishments; therefore, the levels of estimation are higher than for other items in the table.

³Based on ASM sample data.

⁴A response coverage ratio is derived for this item by calculating the ratio of the weighted employment (establishment data multiplied by sample weight) for those ASM establishments that reported to the weighted total employment for all ASM establishments classified in this industry.

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

Table 4. Industry Statistics by Employment Size: 1997

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

Employment size class	E ¹	All establishments		All employees		Production workers			Value added by manufacture (\$1,000)	Cost of materials (\$1,000)	Value of shipments (\$1,000)	Total capital expenditures (\$1,000)
		Total	With 20 employees or more	Number	Payroll (\$1,000)	Number	Hours (1,000)	Wages (\$1,000)				
326122, PLASTICS PIPE & PIPE FITTING MFG												
All establishments	1	441	260	19 685	542 113	15 482	30 437	363 104	1 756 200	3 042 244	4 744 625	240 999
Establishments with 1 to 4 employees	7	71	—	149	3 914	118	199	2 515	12 257	23 533	36 242	1 135
Establishments with 5 to 9 employees	7	48	—	330	9 079	246	443	5 607	30 128	47 875	77 944	2 278
Establishments with 10 to 19 employees	5	62	—	871	22 378	654	1 129	14 452	60 518	102 500	163 568	7 363
Establishments with 20 to 49 employees	1	107	107	3 678	96 263	2 718	5 368	62 109	352 929	641 150	978 378	50 771
Establishments with 50 to 99 employees	—	107	107	7 333	209 431	5 814	11 605	139 063	675 867	1 381 486	2 044 155	99 078
Establishments with 100 to 249 employees	—	43	43	D	D	D	D	D	D	D	D	D
Establishments with 250 to 499 employees	—	2	2	D	D	D	D	D	D	D	D	D
Establishments with 500 to 999 employees	—	1	1	D	D	D	D	D	D	D	D	D
Establishments with 1,000 to 2,499 employees	—	—	—	—	—	—	—	—	—	—	—	—
Establishments with 2,500 employees or more	—	—	—	—	—	—	—	—	—	—	—	—
Administrative records ²	9	112	—	859	19 290	666	1 057	13 373	58 554	120 141	179 670	5 964

¹Some 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 based on administrative-record 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.

²Some 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.

Table 5. Industry Statistics by Industry and Primary Product Class Specialization: 1997

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

NAICS industry or product class code	Industry or primary product class	All establishments	All employees		Production workers			Value added by manufacture (\$1,000)	Cost of materials (\$1,000)	Value of shipments (\$1,000)	Total capital expenditures (\$1,000)
			Number	Payroll (\$1,000)	Number	Hours (1,000)	Wages (\$1,000)				
326122	Plastics pipe & pipe fitting mfg	441	19 685	542 113	15 482	30 437	363 104	1 756 200	3 042 244	4 744 625	240 999
3261221	Plastics pipe	244	14 470	412 913	11 370	22 578	274 891	1 355 547	2 549 843	3 854 236	191 150
3261223	Plastics pipe fittings and unions	36	3 248	82 031	2 561	5 215	55 375	268 522	228 688	490 990	35 810

Table 6a. Products Statistics: 1997 and 1992

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

NAICS product code	Product	1997				1992			
		Number of companies with shipments of \$100,000 or more	Quantity of production for all purposes	Product shipments		Number of companies with shipments of \$100,000 or more	Quantity of production for all purposes	Product shipments	
				Quantity	Value (\$1,000)			Quantity	Value (\$1,000)
326122	Plastics pipe and pipe fittings	N	X	X	4 739 816	N	X	X	N
3261221	Plastics pipe	N	X	X	3 862 926	N	X	X	N
32612211	Plastics drain, waste, and vent pipe	N	X	X	773 967	N	X	X	N
3261221112	Plastics drain, waste, and vent pipe, PVC	44	X	X	529 143	N	X	X	N
3261221114	Plastics drain, waste, and vent pipe, ABS	19	X	X	148 907	N	X	X	N
3261221116	Plastics drain, waste, and vent pipe, other	30	X	X	95 917	N	X	X	N
32612213	Plastics water pipe	N	X	X	1 660 581	N	X	X	N
3261221321	Plastics water pipe, PVC (pressure pipe) Schedule 40	40	X	X	658 924	N	X	X	N
3261221323	Plastics water pipe, CPVC CTS	8	X	X	51 062	N	X	X	N
3261221325	Plastics water pipe, PE (polyethylene)	34	X	X	668 806	N	X	X	N
3261221327	Plastics water pipe, other	25	X	X	281 789	N	X	X	N
32612215	Plastics industrial and mining pipe (including chemical processing, food processing)	N	X	X	326 139	N	X	X	N
3261221531	Plastics industrial and mining pipe (including chemical processing, food processing), PVC (pressure pipe) Schedule 80	20	X	X	117 573	N	X	X	N
3261221533	Plastics industrial and mining pipe (including chemical processing, food processing), CPVC Schedule 80	10	X	X	29 087	N	X	X	N
3261221535	Plastics industrial and mining pipe (including chemical processing, food processing), other	26	X	X	179 479	N	X	X	N
32612216	Plastics sewer pipe	N	X	X	366 527	N	X	X	N
3261221641	Plastics sewer pipe	41	X	X	366 527	49	X	X	273 734
32612217	Plastics oil and gas pipe	N	X	X	259 736	N	X	X	N
3261221751	Plastics oil and gas pipe	18	X	X	259 736	26	X	X	280 247
32612219	Other plastics pipe	N	X	X	399 549	N	X	X	N
3261221991	Other plastics pipe	44	X	X	399 549	73	X	X	297 146
3261221Y	Plastics pipe, nsk	N	X	X	76 427	N	X	X	N
3261221YWW	Plastics pipe, nsk	N	X	X	76 427	N	X	X	N
3261223	Plastics pipe fittings and unions	N	X	X	480 289	N	X	X	N
32612231	Plastics pipe fittings and unions	N	X	X	480 289	N	X	X	N
3261223100	Plastics pipe fittings and unions	57	X	X	480 289	N	X	X	N
326122W	Plastics pipe and pipe fittings, nsk, total	N	X	X	396 601	N	X	X	N
326122WY	Plastics pipe and pipe fittings, nsk	N	X	X	396 601	N	X	X	N
326122WYWW	Plastics pipe and pipe fittings, nsk for nonadministrative-record establishments	N	X	X	219 843	N	X	X	N
326122WYWY	Plastics pipe and pipe fittings, nsk, for administrative-record establishments	N	X	X	176 758	N	X	X	N

Additional information is available for this item; see Appendix F.

@ Additional data are available for these codes at the aggregate U.S. level in the Current Industrial Report (CIR) series; see Appendix F for the CIR survey number and title.

\$ This product is primary to more than one industry; see Appendix F for a listing of the related product codes.

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

Table 6b. Product Class Shipments for Selected States: 1997 and 1992

[Product classes covered are those that are economically significant and whose production is geographically dispersed, provided dispersion is not approximated by data in Table 2. Also, product classes are not shown if they are miscellaneous or "not specified by kind" classes. Statistics for some states are withheld because they are either less than \$2 million in product class shipments or they disclose data for individual companies in 1997. For meaning of abbreviations and symbols, see introductory text. For explanations of terms, see appendixes]

NAICS product class code	Product class and geographic area	Value of product shipments (\$1,000)	
		1997	1992
3261221	PLASTICS PIPE		
	United States	3 862 926	N
	Alabama	61 361	N
	Arkansas	69 297	N
	California	386 087	N
	Colorado	82 808	N
	Florida	140 297	N
	Georgia	234 924	N
	Illinois	86 945	N
	Indiana	132 681	N
	Iowa	106 161	N
	Kansas	64 298	N
	Kentucky	136 935	N
	Louisiana	42 316	N
	Michigan	28 375	N
	Minnesota	114 348	N
	Mississippi	58 172	N
	Missouri	42 452	N
	Nebraska	80 552	N
	Nevada	78 676	N
	New Jersey	16 330	N
	New York	104 487	N
	North Carolina	295 521	N
	Ohio	206 663	N
	Oklahoma	73 255	N
	Oregon	98 590	N
	Pennsylvania	282 300	N
	Rhode Island	7 614	N
	South Carolina	53 850	N
	Tennessee	59 278	N
	Texas	399 967	N
	Washington	78 172	N
	Wisconsin	47 378	N
3261223	PLASTICS PIPE FITTINGS AND UNIONS		
	United States	480 289	N
	Alabama	21 565	N
	California	36 238	N
	Kansas	13 477	N
	Michigan	34 283	N
	New Jersey	8 368	N
	New York	14 321	N
	Ohio	47 608	N
	Oklahoma	33 013	N
	Texas	18 186	N

Additional information is available for this item; see Appendix F.
 @ Additional data are available for these codes at the aggregate U.S. level in the Current Industrial Report (CIR) series; see Appendix F for the CIR survey number and title.
 \$ This product is primary to more than one industry; see Appendix F for a listing of the related product codes.

Table 7. Materials Consumed by Kind: 1997 and 1992

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

NAICS material code	Material consumed	1997		1992	
		Quantity	Delivered cost (\$1,000)	Quantity	Delivered cost (\$1,000)
326122	PLASTICS PIPE & PIPE FITTING MFG				
32121909	Hardboard	X	4 386	X	N
325000A3	Industrial inorganic chemicals	X	1 647	X	N
32513107	Inorganic pigments	X	3 223	X	N
32521105	Plastics resins consumed in the form of granules, pellets, powders, liquids, etc.	X	2 000 084	X	N
325100A1	Industrial organic and synthetic organic chemicals, including plasticizers (except synthetic dyes, pigments, and toners)	X	25 504	X	N
32513200	Synthetic dyes, pigments, lakes, and toners	X	18 212	X	N
32500043	All other chemical and allied products	X	D	X	N
32610013	Plastics products consumed in the form of sheets, rods, tubes, film, and other shapes	X	46 949	X	N
32599100	Custom compounded plastics resins (purchased)	X	119 582	X	N
32721209	Textile-type glass fiber	X	11 667	X	N
31321017	Broadwoven fabrics	X	3 025	X	N
32210015	Paper and paperboard products except paperboard boxes, containers, and corrugated paperboard	X	951	X	N
32221001	Paperboard containers, boxes, and corrugated paperboard	X	10 046	X	N
33322000	Parts and attachments specially designed for plastics working machinery	X	D	X	N
00999803	Spent or post-consumer plastics (purchased)	X	17 090	X	N
00970099	All other materials and components, parts, containers, and supplies	X	183 981	X	N
00971000	Materials, ingredients, containers, and supplies, n.s.k.	X	264 526	X	N

Additional information is available for this item; see Appendix F.

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

Appendix A.

Explanation of Terms

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.

Specific Materials Consumed

In addition to the total cost of materials, which every establishment was required to report, information also was collected for most manufacturing industries on the consumption of major materials used in manufacturing. The inquiries were restricted to those materials which were important parts of the cost of production in a particular industry and for which cost information was available from manufacturers' records. 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.

COST OF PURCHASED SERVICES

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

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

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

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

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

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 non-reporters).

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.

EMPLOYEES

This item includes all full-time and part-time employees on the payrolls of operating manufacturing establishments during any part of the pay period which included the 12th of the months specified on the report form. Included are all persons on paid sick leave, paid holidays, and paid vacations during these pay periods. Officers of corporations are included as employees; proprietors and partners of unincorporated firms are excluded. The "all employees" number is the average number of production workers plus the number of other employees in mid-March. The number of production workers is the average for the payroll periods including the 12th of March, May, August, and November.

Production Workers

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

All Other Employees

This item covers nonproduction employees of the manufacturing establishment including those engaged in factory supervision above the line-supervisor level. It

includes sales (including driver-salespersons), sales delivery (highway 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.

FRINGE BENEFITS

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 BOOK VALUE OF DEPRECIABLE ASSETS 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 and end of year. 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.

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.

NUMBER OF ESTABLISHMENTS AND COMPANIES

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

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

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

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, in contrast to the four-digit SIC 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. This is illustrated as follows:

NAICS level	NAICS code	Description
Industry	33461	Manufacturing and reproduction of magnetic and optical media
U.S. industry	334612	Reproduction of software
Product class	3346120	Prerecorded compact disc (except software), tape, and record reproducing
BLS link code	3346120X	
Product code	3346120XXX	

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

In the new system, there are about 1,500 product classes (seven-digit codes), about 6,000 census products (ten-digit codes), and an additional 3,700 CIR products (ten-digit 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.

PRIMARY PRODUCT CLASS CODE

This file presents selected statistics for establishments according to their degree of specialization in products primary to their industry. This field contains either the six-digit North American Industrial Classification System (NAICS) industry code corresponding to all establishments in the industry, or the seven-digit NAICS product class code for all establishments within the industry that are specialized in a particular product class. Product class specialization is determined by evaluating the ratio of the largest primary product class shipments to total product shipments (primary plus secondary, excluding miscellaneous receipts) for the establishment.

PRODUCTION-WORKER HOURS

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

QUANTITY OF ELECTRIC ENERGY CONSUMED 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. 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.

TOTAL CAPITAL EXPENDITURES (NEW AND USED)

For establishments in operation and any known plants under construction, manufacturers were asked to report their new and used expenditures for (1) permanent additions and major alterations to manufacturing establishments and (2) machinery and equipment used for replacement and additions to plant capacity if they were of the type for which depreciation accounts were ordinarily maintained.

Totals for expenditures include the costs of assets leased from nonmanufacturing concerns through capital leases. New facilities owned by the Federal Government but operated under contract by private companies and plant and equipment furnished to the manufacturer by communities and nonprofit organizations are excluded. Also excluded are expenditures for land and cost of maintenance and repairs charged as current operating expenses.

For any equipment or structure transferred for the use of the reporting establishment by the parent company or one of its subsidiaries, the value at which it was transferred to the establishment was to be reported. If an establishment changed ownership during the year, the cost of the fixed assets (building and equipment) was to be reported.

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.

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:

1. Reported contract work—Receipts for work or services that a plant performed for others on their materials.
2. Value of resales—Sales of products brought and sold without further manufacture, processing, or assembly.
3. 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:

1. Primary products value of shipments.
2. Secondary product value of shipments.
3. 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.

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.

Specialization and Coverage Ratios

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 ratios have been developed to measure the relationship of primary product shipments to the data on shipments for the industry shown in Tables 1a through 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

326122 PLASTICS PIPE AND PIPE FITTING MANUFACTURING

This U.S. industry comprises establishments primarily engaged in converting plastics resins into rigid plastics pipes and pipe fittings.

The data published with NAICS code 326122 include the following SIC industries:

- 3084 Plastics pipe
- 3089 Plastics products, n.e.c. (pt)

Appendix C.

Coverage and Methodology

MAIL/NONMAIL UNIVERSE

The manufacturing universe includes about 400,000 establishments. This number includes those industries in the North American Industry Classification System (NAICS) definition of manufacturing, but not those industries leaving the manufacturing sector in the classification change. The amounts of information requested from manufacturing establishments were dependent upon a number of factors. The more important considerations were the size of the company and whether it was included in the annual survey of manufactures (ASM). The methods of obtaining information for the various subsets of the universe to arrive at the aggregate figures shown in the publication are described below:

1. Small single-establishment companies not sent a report form.

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 our ability to assign the correct six-digit NAICS industry classification to the establishment. For each four-digit Standard Industrial Classification (SIC) 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 which 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 four-digit SIC industry and then erroneously re-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 SIC group classification codes available in the files. For the 1997 Economic Census – Manufacturing, these establishments were sent a separate classification form, which requested information on the products and services of the establishment. This form was used to code many of these establishments to the 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.

2. Establishments sent a report form.

The establishments covered in the mail canvass were divided into three groups:

- 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-1000) replaces the first page of the regular census form for those establishments included in the ASM. In addition to information on employment, payroll, and other items normally requested on the regular census form, establishments in the ASM sample were requested to supply 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 480 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 many cases, the quantity of the product shipped during the survey year. Space also was provided for the respondent to describe products not specifically identified on the form.

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

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

b. Large and medium establishments (non-ASM).

Approximately 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 or 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 nsk categories.

INDUSTRY CLASSIFICATION OF ESTABLISHMENTS

Each of the establishments covered in the 1997 Economic Census – Manufacturing was classified in 1 of 480 industries (473 manufacturing industries and 7 former manufacturing industries) in accordance with the industry definitions in the 1997 NAICS Manual. This is the first edition of the NAICS Manual and it is a major change from the 1987 SIC Manual that was used previously. Appendix A of the 1997 NAICS Manual notes the comparability between the 1987 SIC and 1997 NAICS classification systems. When applicable, Appendix G 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 1997, 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). This represents an expansion of the four-digit SIC-based U.S. industries from 459 in 1987. Product classes and products of the manufacturing industries have been assigned codes based on the industry from which they originate. In the new system, there are about 1,500 product classes (seven-digit codes), about 6,000 census products, and an additional 3,700 CIR products (ten-digit codes). The ten-digit products are considered the primary products of the industry with the same first six digits. These counts do not include the seven former manufacturing industries that are included in the 1997 Economic Census – Manufacturing.

For the 1997 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 1997, 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.

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 which 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 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 1997, 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 1997 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 annual survey of manufactures (ASM) sample is drawn for the second survey year after a census. The most recent sample was drawn for the 1994 survey year based on the 1992 Census of Manufactures. This sample will be in place through the 1998 ASM.

In 1992, there were approximately 370,000 individual manufacturing establishments. For sample efficiency and cost considerations, the 1992 manufacturing population was partitioned into two components for developing estimates within the ASM; a mail stratum and a nonmail stratum.

Mail stratum. The mail stratum of the survey is comprised of larger single-location manufacturing companies and all manufacturing establishments of multiunit companies (companies that operate at more than one physical location). Approximately 230,000 of the 370,000 establishments in the 1992 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 1994 survey, a new sample of approximately 58,000 individual establishments was selected from the mail stratum assembled from the 1992 census. Supplemental samples representing both 1993 and 1994 births (newly active establishments that were not included in the 1992 census) were also selected. Establishments selected for the sample are mailed an ASM survey questionnaire for each year through 1998.

The 1994-98 ASM sample design is similar to the one used since 1984. Companies in the 1992 Census of Manufactures 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 1994-98 sample, there are approximately 650 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. In addition, all establishments producing products in SIC 3571 (Electronic Computers) were defined as certainties. Across these three 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 1992 Census of Manufactures.

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 1992 industry classification, its 1992 product class data, and the historical variability of the year-to-year estimates of the product class estimates. For each product class (1,755) and four-digit industry (459), 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 our 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) which permits us to prevent small establishments from being selected in consecutive samples without introducing a bias into the survey estimates.

Nonmail component. The initial nonmail component of the survey was comprised of approximately 140,000 small, single-establishment companies that were tabulated as administrative records in the 1992 Census of Manufactures. 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.

DESCRIPTION OF THE ASM ESTIMATING PROCEDURE

Most of the ASM 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 1992 (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 1993-1997 ASM estimates, the 1992 Census of Manufactures values serve as the base year. For the 1998 ASM, the base will be updated to be the 1997 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 contains approximately 170,000 individual establishments in 1994, 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.

QUALIFICATIONS OF THE ASM DATA

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.

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.

DATA FROM THE CURRENT INDUSTRIAL REPORTS (CIR)

The CIR program provides product statistics for selected manufacturing industries at the U.S. level annually and, in some cases, monthly and/or quarterly. When detail product data are collected in the CIR, they are not also collected in the census. However, the annual CIR data are included in the census Product Summary report.

The CIR program uses a unified data collection, processing, and publication system. The Census Bureau updates the survey panels for most reports annually and reconciles the estimates to the results of the broader-based annual survey of manufactures and the economic

census – manufacturing. The economic census – manufacturing provides a complete list of all producers of the products covered by the CIR program and serves as the primary source for CIR sampling. Where a small number of producers exist, CIR surveys cover all known producers of a product. However, when the number of producers is large, cutoff and random sampling techniques are used. Surveys are continually reviewed and modified to provide the most up-to-date information on products produced. While the CIR program includes both mandatory and voluntary surveys, the annual data are mandatory.

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 1997 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.

Appendix D. Geographic Notes

Not applicable for this report.

Appendix E. Metropolitan Areas

Not applicable for this report.

Appendix F. Footnotes for Products Statistics and Materials Consumed by Kind

Not applicable for this report.

Appendix G. Comparability of Product Classes and Product Codes: 1997 to 1992

1997 published	1997 collected	1992 published	1997 published	1997 collected	1992 published	1997 published	1997 collected	1992 published
32611111	26732	26732	3261402	3086C	30862 pt	3261600	30850	30850
3261111111	2673211	2673211	3261402125	3086C25	3086220 pt	3261600100	3085000 pt	3085000 pt
3261111215	2673212	2673212	3261402255	3086C15	3086210 pt	3261600YWW	3085000 pt	3085000 pt
3261111321	2673214	2673214	3261402295	3086C95	3086290 pt	3261600YWY	3085002	3085002
3261111431	2673217	2673217	3261402YVW	3086C00	3086200 pt	3261910	30880	30880
3261111541	2673213	2673213	3261403	3086E	30863 pt	3261910000	3088000 pt	3088000 pt
3261111551	2673215	2673215	3261403115	3086E15	3086310 pt	3261910YWW	3088000 pt	3088000 pt
3261111561	2673216	2673216	3261403195	3086E95	3086390 pt	3261910YWY	3088002	3088002
3261111571	2673218	2673218	3261403YVW	3086E00	3086300 pt	3261920 pt	30690 pt	30690 pt
3261111681	2673221	2673221	3261404	3086H	30864 pt	3261920 pt	30694 pt	30694 pt
3261111791	2673223	2673223	3261404100	3086H00	3086400 pt	3261920 pt	30694 pt	30694 pt
3261111YVW	2673200	2673200	3261404100 pt	3086H00 pt	3086490 pt	3261920 pt	30694 pt	30694 pt
3261113	26733 pt	26733 pt	3261405	3086J	30865 pt	3261920 pt	30694 pt	30694 pt
3261113100	2673300 pt	2673300 pt	3261405115	3086J15	3086510	326192010 pt	3069428 pt	3069428 pt
3261113100 pt	2673309	2673314 pt	3261405225	3086J25	3086520	326192010 pt	3069428 pt	3069428 pt
326111W	26730 pt	26730 pt	3261405235	3086J35	3086530	326192010 pt	3069428 pt	3069428 pt
326111WYWW	2673000 pt	2673000 pt	3261405245	3086J45	3086540	326192010 pt	3069429 pt	3069429 pt
326111WYWY	2673002 pt	2673002 pt	3261405295	3086J95	3086590 pt	326192010 pt	3069429 pt	3069429 pt
3261121	26712	26712	3261405YVW	3086J00	3086500 pt	326192010 pt	3069429 pt	3069429 pt
326121111	2671211	2671211	3261406	3086L	30866 pt	326192010 pt	3069429 pt	3069429 pt
326121221	2671212	2671212	3261406115	3086L15	3086610 pt	3261920YWW pt	3069440 pt	3069440 pt
326121YVW	2671200	2671200	3261406195	3086L95	3086690 pt	3261920YWW pt	3069440 pt	3069440 pt
3261123	26716	26714 pt	3261406YVW	3086L00	3086600 pt	3261920YWY pt	3069002 pt	3069002 pt
326123111	2671612	2671412	326140W	30860 pt	30860 pt	3261920YWY pt	3069002 pt	3069002 pt
326123221	2671615	2671415	326140WYWW	3086000 pt	3086000 pt	3261991	30891	30891
326123331	2671617	2671417	326140WYWY	3086002	3086002 pt	3261991111	3089101	3089101
326123341	2671621	2671421	3261501	3086B	30861 pt	3261991121	3089103	3089103
326123YVW	2671600	2671400 pt	3261501101	3086B01	3086100 pt	3261991131	3089109	3089109
326112W	26710 pt	26710 pt	3261501102	3086B02	3086100 pt	3261991YVW	3089100	3089100
326112WYWW	2671000 pt	2671000 pt	3261501103	3086B03	3086100 pt	3261992	30892	30892
326112WYWY	2671002 pt	2671002 pt	3261501YVW	3086B00	3086100 pt	3261992111	3089210	3089210
3261130	30810	30810	3261502	3086D	30862 pt	3261992121	3089220	3089220
3261130121	3081020	3081020	3261502116	3086D16	3086210 pt	3261992131	3089230	3089230
3261130231	3081030	3081030	3261502126	3086D26	3086210 pt	3261992191	3089290	3089290
3261130341	3081040	3081040	3261502196	3086D96	3086210 pt	3261992YVW	3089200	3089200
3261130449	3081010	3081010	3261502YVW	3086D00	3086200 pt	3261993	30893	30893
3261130451	3081045	3081050 pt	3261503	3086F	30863 pt	3261993100	3089300	3089300
3261130453	3081060	3081050 pt	3261503116	3086F16	3086310 pt	3261994	30894	30894
3261130YVW	3081000	3081000	3261503196	3086F96	3086390 pt	3261994111	3089401	3089401
3261130YWY	3081002	3081002	3261503YVW	3086F00	3086300 pt	3261994115	3089402	3089402
3261210	30820	30820	3261504	3086G	30864 pt	3261994121	3089403	3089403
3261210111	3082010	3082010	3261504110	3086G25	3086420 pt	3261994125	3089405	3089405
3261210231	3082030	3082030	3261504215	3086G15	3086410 pt	3261994131	3089406	3089406
3261210341	3082040	3082040	3261504216	3086G16	3086410 pt	3261994135	3089407	3089407
3261210451	3082050	3082050	3261504227	3086G27	3086430 pt	3261994141	3089408	3089408
3261210561	3082060	3082060	3261504228	3086G28	3086430 pt	3261994145	3089410	3089410
3261210681	3082080	3082080	3261504237	3086G37	3086490 pt	3261994151	3089420	3089420
3261210787	3082020	3082020	3261504YVW	3086G00	3086400 pt	3261994155	3089430	3089430
3261210789	3082070	3082070	3261505	3086K	30865 pt	3261994161	3089440	3089440
3261210791	3082090	3082090	3261505100 pt	3086K00 pt	3086500 pt	3261994191	3089490	3089490
3261210YVW	3082000	3082000	3261505100 pt	3086K00 pt	3086590 pt	3261995	30895	30895
3261210YWY	3082002	3082002	3261506	3086M	30866 pt	3261995111	3089501	3089501
3261221	30840 pt	30840 pt	3261506116	3086M16	3086610 pt	3261995121	3089502	3089502
3261221112	3084001	3084011 pt	3261506196	3086M96	3086690 pt	3261995131	3089503	3089503
3261221114	3084004	3084011 pt	3261506YVW	3086M00	3086600 pt	3261995YVW	3089500	3089500
3261221116	3084006	3084011 pt	3261509 pt	3086N pt	30861 pt	3261996 pt	30896	30896
3261221321	3084021	3084014 pt	3261509 pt	3086N pt	30862 pt	3261996 pt	30896 pt	30896 pt
3261221323	3084023	3084014 pt	3261509 pt	3086N pt	30863 pt	3261996111	3089611	3089611
3261221325	3084025	3084014 pt	3261509 pt	3086N pt	30864 pt	3261996115	3089612	3089612
3261221327	3084027	3084014 pt	3261509 pt	3086N pt	30865 pt	3261996121	3089613	3089613
3261221531	3084031	3084015 pt	3261509 pt	3086N pt	30866 pt	3261996125	3089614	3089614
3261221533	3084033	3084015 pt	3261509 pt	3086N pt	30867 pt	3261996131	3089615	3089615
3261221535	3084035	3084015 pt	3261509100 pt	3086N00 pt	3086100 pt	3261996135	3089616	3089616
3261221641	3084012	3084012	3261509100 pt	3086N00 pt	3086200 pt	3261996141	3089617	3089617
3261221751	3084013	3084013	3261509100 pt	3086N00 pt	3086210 pt	3261996145	3089618	3089618
3261221991	3084089	3084019	3261509100 pt	3086N00 pt	3086220 pt	3261996151	3089619	3089619
3261221YVW	3084000 pt	3084000 pt	3261509100 pt	3086N00 pt	3086290 pt	3261996155	3089621	3089621
3261223	30898 pt	30898 pt	3261509100 pt	3086N00 pt	3086300 pt	3261996161	3089622	3089622
3261223100 pt	3089800 pt	3089800 pt	3261509100 pt	3086N00 pt	3086310 pt	3261996165	3089623	3089623
3261223100 pt	3089815	3089805 pt	3261509100 pt	3086N00 pt	3086390 pt	3261996171	3089624	3089624
326122W pt	30840 pt	30840 pt	3261509100 pt	3086N00 pt	3086400 pt	3261996175	3089625	3089625
326122W pt	30890 pt	30890 pt	3261509100 pt	3086N00 pt	3086410 pt	3261996181	3089626	3089626
326122WYWW pt	3084000 pt	3084000 pt	3261509100 pt	3086N00 pt	3086420 pt	3261996185 pt	3089627	3089627
326122WYWY pt	3089000 pt	3089000 pt	3261509100 pt	3086N00 pt	3086430 pt	3261996185 pt	3089993 pt	3089993 pt
326122WYWY pt	3084002	3084002	3261509100 pt	3086N00 pt	3086490 pt	3261996185 pt	3089993 pt	3089993 pt
326122WYWY pt	3089002 pt	3089002 pt	3261509100 pt	3086N00 pt	3086500 pt	3261996185 pt	3089993 pt	3089993 pt
3261300	30830	30830	3261509100 pt	3086N00 pt	3086590 pt	3261996YVW pt	3089600	3089600
3261300111	3083011	3083011	3261509100 pt	3086N00 pt	3086610 pt	3261996YVW pt	3089900 pt	3089900 pt
3261300221	3083013	3083013	3261509100 pt	3086N00 pt	3086690 pt	3261997	30897 pt	30897 pt
3261300391	3083019	3083019	326150W	30860 pt	30860 pt	3261997111	3089701	3089701
3261300YVW	3083000	3083000	326150WYWW	3086000 pt	3086000 pt	3261997121	3089719	3089719
3261300YWY	3083002	3083002	326150WYWY	3086000 pt	3086002 pt	3261997YVW	3089700 pt	3089700 pt
3261401	3086A	30861 pt						
3261401100	3086A00	3086100 pt						

1997 published	1997 collected	1992 published	1997 published	1997 collected	1992 published	1997 published	1997 collected	1992 published
3261998	30898 pt	30898 pt	3262120	75340	75340	3262991	30693	30693
3261998111	3089801	3089801	3262120100	7534000 pt	7534000 pt	3262991111	3069317	3069317
3261998131	3089803	3089803	3262120YWW	7534000 pt	7534000 pt	3262991115	3069323	3069323
3261998141	3089804	3089804	3262120YWY	7534002	7534002 pt	3262991121	3069351	3069351
3261998152	3089816	3089805 pt				3262991125	3069368	3069368
3261998171 pt	3089817 pt	3089806	3262201	30521	30521	3262991231	3069373	3069373
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3261998181	3089818	3089808	3262201143	3052143	3052143	3262991241	3069375	3069375
3261998191 pt	3089819 pt	3089802	3262201151 pt	3052151 pt	3052145	3262991245	3069377	3069377
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3261998YVW	3089800 pt	3089800 pt	3262201YVW	3052100	3052100	3262991255	3069383	3069383
						3262991261	3069384	3069384
3261999	30899	30899	3262202	30522	30522	3262991YVW	3069300	3069300
3261999100	3089900	3089900	3262202125	3052225	3052225			
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326199A	3089A	3089A	3262202245 pt	3052245 pt	3052241	3262993121	3069422	3069421 pt
326199A111	3089A11	3089A11	3262202245 pt	3052245 pt	3052251	3262993131	3069423	3069423
326199A121	3089A12	3089A12	3262202245 pt	3052245 pt	3052289	3262993141	3069424	3069425 pt
326199A131	3089A14	3089A14	3262202YVW	3052200	3052200	3262993151	3069427	3069426 pt
326199A141	3089A18	3089A18				3262993YVW	3069400 pt	3069400 pt
326199AYVW	3089A00	3089A00	3262203	3052A	3052A			
			3262203101	3052A01	3052A01	3262994	30696	30696
326199W pt	30890 pt	30890 pt	3262203105	3052A02	3052A02	3262994111	3069615	3069615
			3262203YVW	3052A00	3052A00	3262994121	3069651	3069651
326199W pt	39990 pt	39990 pt				3262994131	3069661	3069661
326199WYVW pt	3089000 pt	3089000 pt	3262204	3052B	3052B	3262994YVW	3069600	3069600
326199WYVW pt	3999000 pt	3999000 pt	3262204100	3052B00	3052B00			
326199WYVW pt	3089002 pt	3089002 pt				3262995 pt	3069F pt	30695
326199WYVW pt	3999002 pt	3999002 pt	3262205	3052C	3052C			
			3262205100	3052C00	3052C00	3262995 pt	3069F pt	30698
3262111	30111	30111				3262995131	3069F31	3069831
3262111112	3011112	3011112	3262206	3052D	3052D	3262995151 pt	3069F41 pt	3069851
3262111115	3011115	3011115	3262206101	3052D01	3052D01	3262995181 pt	3069F41 pt	3069861
3262111YVW	3011100	3011100	3262206105	3052D02	3052D02	3262995181 pt	3069F81 pt	3069500
			3262206YVW	3052D00	3052D00	3262995YVW	3069F81 pt	3069871
							3069F00	3069800
3262113	30112	30112	3262207	3052F	3052F	3262996	30699	30699
3262113111	3011211	3011211	3262207125 pt	3052F25 pt	3052F10	3262996100	3069900	3069900
3262113212	3011212	3011212	3262207125 pt	3052F25 pt	3052F20			
3262113221	3011221	3011221	3262207145 pt	3052F45 pt	3052F30			
3262113222	3011222	3011222	3262207145 pt	3052F45 pt	3052F40			
3262113231	3011231	3011231	3262207YVW	3052F00	3052F00			
3262113232	3011232	3011232						
3262113YVW	3011200	3011200						
			3262208	3052G	3052G	3262997	3069C	3069C
3262117	30117	30117	3262208125 pt	3052G25 pt	3052G10	3262997111	3069C11	3069C11
3262117100	3011700	3011700	3262208125 pt	3052G25 pt	3052G20	3262997115	3069C12	3069C12
			3262208145 pt	3052G45 pt	3052G30	3262997125	3069C15	3069C15
			3262208145 pt	3052G45 pt	3052G40	3262997131	3069C16	3069C16
3262119	30118	30118	3262208YVW	3052G00	3052G00	3262997135	3069C17	3069C17
3262119100	3011800	3011800				3262997137	3069C14	3069C14
			326220W	30520	30520	3262997141	3069C23	3069C23
326211B	30119	30119	326220WYVW	3052000	3052000	3262997145	3069C24	3069C24
326211B100 pt	3011900 pt	3011900	326220WYVW	3052002	3052002	3262997151	3069C30	3069C30
326211B100 pt	3011900 pt	3011921				3262997155	3069C44	3069C44
326211B100 pt	3011900 pt	3011922	3262911	30611	30611	3262997YVW	3069C00	3069C00
326211B100 pt	3011900 pt	3011925	3262911100	3061100	3061100			
						3262998	3069D pt	3069D pt
326211D	3011A	3011A	3262912	30612	30612	3262998111	3069D41	3069D41
326211D139	3011A39	3011A39	3262912100	3061200	3061200	3262998121	3069D42	3069D42
326211D152	3011A52	3011A52				3262998YVW	3069D00 pt	3069D00 pt
326211DYVW	3011A00	3011A00	3262913	30613	30613			
			3262913100	3061300	3061300	3262999	3069E	3069E
326211F	3011C	3011C				3262999111	3069E13	3069E13
326211F121	3011C21	3011C21	3262914	30614	30614	3262999115	3069E19	3069E19
326211F123	3011C23	3011C23	3262914100	3061400	3061400	3262999121	3069E20	3069E20
326211F127 pt	3011C27 pt	3011C25				3262999125	3069E21	3069E21
326211F127 pt	3011C27 pt	3011C29	3262915	30615	30615	3262999131	3069E22	3069E22
326211FYVW	3011C00	3011C00	3262915100	3061500	3061500	3262999135	3069E23	3069E23
						3262999141	3069E28	3069E28
326211H	3011D	3011D	3262916	30616	30616	3262999145	3069E26	3069E26
326211H111	3011D11	3011D11	3262916100	3061600	3061600	3262999151	3069E27	3069E27
326211H231	3011D31	3011D31				3262999155	3069E29	3069E29
326211H239	3011D39	3011D39	3262917	30617	30617	3262999YVW	3069E00	3069E00
326211HYVW	3011D00	3011D00	3262917100	3061700	3061700			
						326299W	30690 pt	30690 pt
326211W	30110	30110	326291W	30610	30610	326299WYVW	3069000 pt	3069000 pt
326211WYVW	3011000	3011000	326291WYVW	3061000	3061000			
326211WYVW	3011002	3011002	326291WYVW	3061002	3061002	326299WYVW	3069002 pt	3069002 pt

