

# Electromedical and Irradiation Equipment: 2004

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## NOTICE

**The MA334S annual survey is discontinued as of December 2004.  
The 2004 annual report is the last publication for this survey.**

**The 2005 new annual report MA334A, "Analytical and Biomedical Instruments"  
will include data from electromedical and irradiation equipment.**

Current data are released electronically on Internet for all individual surveys as they become available. Use: <http://www.census.gov/mcd/>. Individual reports can be accessed by choosing "Current Industrial Reports (CIR)," clicking on "CIRs by Subsector;" then choose the survey of interest. Follow the menu to view the PDF file or to download the worksheet file (XLS format) to your personal computer.

These data are also available on Internet through the U.S. Department of Commerce and STAT-USA by subscription. The Internet address is: [www.stat-usa.gov/](http://www.stat-usa.gov/). Follow the prompts to register. Also, you may call 202-482-1986 or 1-800-STAT-USA, for further information.

## SUMMARY OF FINDINGS

In 2004, the total value of shipments of electro-medical and irradiation equipment amounted to \$17.8 billion, an increase of 7.0 percent from \$16.6 billion in 2003. Shipments of X-ray and other irradiation equipment increased 4.0 percent to \$5.2 billion in 2004, from \$4.9 billion in 2003. Shipments of electromedical equipment increased 7.0 percent to \$12.6 billion in 2004, from \$11.7 billion in 2003.

For general CIR information, explanation of general terms and historical note, see the appendix.

**Current  
Industrial  
Reports**

Address inquiries concerning these data to Investment Goods Industries Branch, Manufacturing and Construction Division (MCD), Washington, DC 20233-6900, or call Kellie Friedrich, 301-763-5168.

For mail or fax copies of this publication, please contact the Information Services Center, MCD, Washington, DC 20233-6900, or call 301-763-4673.

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

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Table 1. Value of Shipments of Electromedical Equipment and Irradiation Equipment by Class of Product: 1999 to 2004  
 [Value in millions of dollars]

Product code	Product description	2004	2003	2002	2001	2000	1999
3345170	X-ray and other irradiation equipment .....	5,196.6	4,873.5	4,524.2	4,283.5	3,502.1	3,200.9
3345101	Electromedical equipment.....	12,628.1	11,747.0	12,125.7	11,088.3	10,896.7	10,699.8

Table 2. Quantity and Value of Shipments of Electromedical Equipment and Irradiation Equipment: 2004 and 2003  
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2004		2003	
			Quantity	Value	Quantity	Value
	Electromedical and irradiation equipment.....	242	(X)	17,824,702	(X)	16,620,483
	Medical diagnostic equipment:					
	X-ray equipment:					
3345170103	Digital radiography equipment.....	5	4,216	255,672	3,691	r/ 207,681
3345170106	Computerized axial tomography (CT or CAT scan).....	5	4,474	971,484	r/ 4,540	r/ 992,008
3345170109	Dental and conventional.....	9	(D)	(D)	(D)	(D)
3345170112	All other medical diagnostic X-ray equipment.....	15	(X)	584,210	(X)	r/ 566,372
3345170115	Nuclear medicine equipment (all equipment used for nuclear in vivo studies).....	9	2,907	470,444	3,387	634,808
3345101103	Magnetic resonance imaging equipment (MRI).....	5	(D)	(D)	(D)	(D)
3345101106	Ultrasound scanning devices.....	9	52,584	1,217,821	39,427	r/ 1,273,989
3345101109	Electrocardiograph (EKG).....	9	104,197	a/ 193,357	99,319	176,800
3345101112	Electroencephalograph (EEG) and electromyograph (EMG).....	3	(D)	(D)	(D)	(D)
3345101115	Audiological equipment.....	6	(X)	14,694	(X)	11,304
3345101118	Endoscopic equipment (bronchoscope, cystoscope, proctosigmoidoscope, colonoscope, etc.).....	8	(D)	(D)	(D)	(D)
3345101121	Respiratory analysis equipment.....	3	(D)	(D)	(D)	r/ (D)
3345101124	All other medical diagnostic equipment.....	19	(X)	b/ 145,969	(X)	a/ r/ 136,899
	Patient monitoring equipment:					
3345101227	Intensive care/coronary care units, including component modules such as temperature, blood pressure, and pulse.....	14	(X)	717,220	(X)	a/ 708,678
3345101233	Prenatal and respiratory monitoring.....	6	(X)	c/ 93,186	(X)	c/ r/ 88,274
3345101237	All other patient monitoring.....	21	(X)	a/ 556,598	(X)	b/ r/ 506,062
	Medical therapy equipment:					
3345101241	Ultrasound therapy.....	7	(X)	35,320	(X)	a/ 27,084
3345101244	Pacemakers.....	4	(D)	(D)	(D)	(D)
3345101247	Defibrillators.....	8	182,496	1,877,621	155,871	1,620,715
3345101251	Dialyzers, including machines and equipment.....	4	(X)	672,000	(X)	652,926
3345101254	Medical laser equipment.....	11	(X)	a/ 381,795	(X)	r/ 407,521
3345170118	Radiation therapy (linear accelerators, X-ray, cobalt 60, brachtherapy).....	9	(X)	(D)	(X)	(D)
3345101257	All other medical therapy equipment.....	35	(X)	1,633,197	(X)	b/ r/ 1,555,559
	All other irradiation and electromedical equipment:					
3345170121	Industrial and scientific X-ray equipment.....	15	b/ 6,034	a/ 583,794	c/ 5,102	a/ r/ 506,380
3345170124	X-ray tubes, sold separately.....	10	a/ 31,909	198,631	r/ 27,946	r/ 180,827
3345170227	Other nonmedical irradiation equipment, including gamma and beta ray equipment, n.e.c. ....	3	(X)	a/ 31,274	(X)	a/ 16,745
3345170331	Parts and accessories for X-ray equipment and other nonmedical irradiation equipment, n.e.c. ....	19	(X)	364,823	(X)	r/ 267,337
	Surgical systems:					
3345101361	Electrosurgical equipment.....	8	(X)	552,521	(X)	384,990
3345101367	Blood flow systems.....	8	(X)	a/ 501,846	(X)	a/ r/ 413,486
3345101371	All other surgical support systems.....	14	(X)	352,294	(X)	335,126
3345101374	Other electromedical equipment (except diagnostic and therapeutic), n.e.c. ....	11	(X)	b/ 427,299	(X)	b/ 341,712
3345101477	Electromedical parts and accessories, including diagnostic and therapeutic, n.e.c. ....	35	(X)	a/ 1,408,620	(X)	a/ 1,281,974

D Withheld to avoid disclosing data for individual companies. n.e.c. Not elsewhere classified. r/Revised by 5 percent by 5 percent or more from previously published data. X Not applicable.

Note: Percent of estimation for each item is indicated as follows: a/10 to 25 percent of this item is estimated. b/26 to 50 percent of this item is estimated. c/Over 50 percent of this item is estimated.

Table 3. Shipments, Exports, and Imports of Electromedical and Irradiation Equipment: 2004  
 [Value in thousands of dollars]

Product code	Product description	Manufacturers' shipments (value f.o.b. plant)	Exports of domestic merchandise (value at port) 1/	Imports for consumption (value) 2/ 3/
3345170 106	Computerized axial tomography (CT or CAT scan).....	971,484	292,567	547,876
3345170 103, 109, 112, 115, 118	Medical x-ray and nuclear equipment, diagnostic and therapeutic.....	3,046,572	702,311	994,911
3345170 121	Industrial and scientific X-ray equipment.....	583,794	252,046	119,430
3345170 124	X-ray tubes, sold separately.....	198,631	188,781	207,350
3345170 331	Parts and accessories for X-ray equipment and other nonmedical irradiation equipment, n.e.c. ....	364,823	739,672	622,620
3345170 227	Nonmedical irradiation equipment, including gamma and beta ray equipment, n.e.c. ....	31,274	40,361	5,683
3345101 109	Electrocardiograph (EKG), diagnostic.....	193,357	74,777	24,106
3345101 112	Electroencephalographs (EEG) and electromyograph (EMG).....	(D)	29,630	10,856
3345101 106	Ultrasound scanning devices, diagnostic.....	1,217,821	527,382	241,913
3345101 103	Magnetic resonance imaging equipment (MRI).....	(D)	285,560	509,556
3345101 244	Pacemakers, therapeutic.....	(D)	452,099	1,301,526
3345101 115, 118, 121, 124	Diagnostic electromedical equipment, n.e.c. ....	287,114	953,467	698,232
3345101 247, 254, 257	Therapeutic electromedical equipment, n.e.c. ....	3,892,613	159,178	36,333
3345101 367, 371, 374	Electromedical equipment and irradiation equipment, including X-ray, n.e.c. ....	1,281,439	286,998	566,965
3345101 251	Dialyzers, machines and equipment.....	672,000	66,253	29,519
3345101 227, 233, 237	Patient monitoring equipment.....	1,367,004	215,256	257,748
3345101 241	Therapeutic ultrasound equipment.....	35,320	5,380	2,832
3345101 361	Electrosurgical equipment.....	552,521	796,041	250,038
3345101 477	Electromedical parts and accessories, including diagnostic and therapeutic, n.e.c. ....	1,408,620	833,084	1,118,300

D Withheld to avoid disclosing data for individual companies. n.e.c. Not elsewhere classified.

1/Source: Census Bureau report EM 545, U.S. Exports.

2/Source: Census Bureau report IM 145, U.S. Imports for Consumption.

3/Represents c.i.f. (cost, insurance, and freight) value at first port of entry in the United States plus import duties.

Table 4. Comparison of North American Industry Classification System (NAICS)-Based Product Codes with Schedule B Export Codes, and HTSUSA Import Codes: 2004

Product code	Product description	Export code 1/	Import code 2/
3345170106	Computerized axial tomography (CT or CAT scan).....	9022.12.0000	9022.12.0000
3345170103, 109, 112, 115, 118	Medical X-ray and nuclear equipment, diagnostic and therapeutic.....	9022.13.0000 9022.14.0000 9022.21.0000	9022.13.0000 9022.14.0000 9022.21.0000
3345170121	Industrial and scientific X-ray equipment.....	9022.19.0000	9022.19.0000
3345170124	X-ray tubes, sold separately.....	9022.30.0000	9022.30.0000
3345170331	Parts and accessories for X-ray equipment and other nonmedical irradiation equipment, n.e.c. ....	9022.90.4000 9022.90.6000 9022.90.8000	9022.90.4000 9022.90.6000 9022.90.9500
3345170227	Nonmedical irradiation equipment, including gamma and beta ray equipment, n.e.c. ....	9022.29.8000	9022.29.8000
3345101109	Electrocardiograph (EKG), diagnostic.....	9018.11.0040	9018.11.3000
3345101112	Electroencephalographs (EEG) and electromyographs (EMG), diagnostic.....	9018.19.9535	9018.19.9535
3345101106	Ultrasound scanning devices, diagnostic.....	9018.12.0000	9018.12.0000
3345101103	Magnetic resonance imaging equipment (MRI).....	9018.13.0000	9018.13.0000
3345101244	Pacemakers, therapeutic.....	9021.50.0000	9021.50.0000
3345101115, 118, 121, 124	Diagnostic electromedical equipment, n.e.c. ....	9018.19.4000 9018.19.9530 9018.19.9550	9018.19.4000 9018.19.9530 9018.19.9550
3345101247, 254, 257	Therapeutic electromedical equipment, n.e.c. ....	9018.90.7060	9018.20.0040 9018.90.6400 9018.90.7560
3345101367, 371 374	Electromedical equipment and irradiation equipment including X-ray, n.e.c. ....	9018.20.0000 9018.90.7080	9018.20.0080 9018.90.7580
3345101251	Dialyzers, machines and equipment.....	9018.90.7020	9018.90.7520
3345101227, 233, 237	Patient monitoring equipment.....	9018.19.5500	9018.19.5500
3345101241	Therapeutic ultrasound equipment.....	9018.90.7040	9018.90.7540
3345101361	Electrosurgical equipment.....	9018.90.6000	9018.90.6000
3345101477	Electromedical parts and accessories, including diagnostic and therapeutic, n.e.c. ....	9018.11.0080 9018.19.7500 9018.19.9560 9018.90.7070	9018.11.9000 9018.19.7500 9018.19.9560 9018.90.7570 9021.90.4080

n.e.c. Not elsewhere classified.

1/Source: 2004 Edition, Harmonized System-based Schedule B, Statistical Classification of Domestic and Foreign Commodities Exported from the United States.

2/Source: Harmonized Tariff Schedule of the United States, Annotated (2004).

# Appendix.

## General CIR Survey Information, Explanation of General Terms and Historical Note

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### GENERAL

The CIR program has been providing monthly, quarterly, and annual measures of industrial activity for many years. Since 1904, with its cotton and fats and oils surveys, the CIR program has formed an essential part of an integrated statistical system involving the quinquennial economic census, manufacturing sector, and the annual survey of manufactures. The CIR surveys, however, provide current statistics at a more detailed product level than either of the other two statistical programs.

The primary objective of the CIR program is to produce timely, accurate data on production and shipments of selected products. The data are used to satisfy economic policy needs and for market analysis, forecasting, and decision making in the private sector. The product-level data generated by these surveys are used extensively by individual firms, trade associations, and market analysts in planning or recommending marketing and legislative strategies, particularly if their industry is significantly affected by foreign trade. Although production and shipments information are the two most common data items collected, the CIR program collects other measures also such as inventories, orders, and consumption. These surveys measure manufacturing activity in important commodity areas such as textiles and apparel, chemicals, primary metals, computer and electronic components, industrial equipment, aerospace equipment, and consumer goods.

The CIR program uses a unified data collection, processing, and publication system. The U.S. 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 sector. The manufacturing sector 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 too 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. The CIR program includes a group of mandatory and voluntary surveys. Typically the monthly and quarterly surveys are conducted on a voluntary basis. Those companies that choose not to respond to the voluntary surveys are required to submit a mandatory annual counterpart corresponding to the more frequent survey.

### NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS), 1997

The adoption of the North American Industry Classification System (NAICS) in the 1997 Economic Census has had a major impact on the comparability of current and historic data. 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.

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 that left manufacturing are logging and portions of publishing. Prominent among the industries that came into the manufacturing sector are bakeries, candy stores where candy is made on the premises, custom tailors, makers of custom draperies, and tire retreading. The net effect of the classification changes are such that if the 1997 value of shipments data for all manufacturers were tabulated on an SIC basis, it would be approximately 3 percent higher.

Listed below are the NAICS sectors:

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

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

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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).

## FUNDING

The Census Bureau funds most of the surveys. However, a number of surveys are paid for either fully or partially by other Federal Government agencies or private trade associations. A few surveys are mandated, but all are authorized by Title 13 of the United States Code.

## RELIABILITY OF DATA

Survey error may result from several sources including the inability to obtain information about all cases in the survey, response errors, definitional difficulties, differences in the interpretation of questions, mistakes in recording or coding the reported data, and other errors of collection, response, coverage, and estimation. These nonsampling errors also occur in complete censuses. Although no direct measurement of the biases due to these nonsampling errors has been obtained, precautionary steps were taken in all phases of the collection, processing, and tabulation of the data in an effort to minimize their influence.

A major source of bias in the published estimates is the imputing of data for nonrespondents, for late reporters, and for data that fail logic edits. Missing figures are imputed based on period-to-period movements shown by reporting firms. A figure is considered to be an impute if the value was not directly reported on the questionnaire, directly derived from other reported items, directly available from supplemental sources, or obtained from the respondent during the analytical review phase. Imputation generally is limited to a maximum of 10 percent for any one data cell. Figures with imputation rates greater than 10 percent are suppressed or footnoted. The imputation rate is not an explicit indicator of the potential error in published figures due to nonresponse, because the actual yearly movements for nonrespondents may or may not closely agree with the imputed movements. The range of difference between the actual and imputed figures is assumed to be small. The degree of uncertainty regarding the accuracy of the published data increases as the percentage of imputation increases. Figures with imputation rates above 10 percent should be used with caution.

## DATA REVISIONS

Statistics for previous years may be revised as the result of corrected figures from respondents, late reports for which imputations were originally made, or other corrections. Data that have been revised by more than 5 percent from previously published data are indicated by footnotes.

## DISCLOSURE

The Census Bureau collects the CIR data under the authority of Title 13, United States Code, which specifies that the information can only be used for statistical purposes and cannot be published or released in any manner that would identify a person, household, or establishment. "D" indicates that data in the cell have been suppressed to avoid disclosure of information pertaining to individual companies.

## EXPLANATION OF GENERAL TERMS

**Capacity.** The maximum quantity of a product that can be produced in a plant in 1 day if operating for 24 hours. Includes the capacity of idle plants until the plant is reported to be destroyed, dismantled, or abandoned.

**Consumption.** Materials used in producing or processing a product or otherwise removing the product from the inventory.

**Exports.** Includes all types of products shipped to foreign countries, or to agents or exporters for reshipment to foreign countries.

**Gross shipments.** The quantity or value of physical shipments from domestic establishments of all products sold, transferred to other establishments of the same company, or shipped on consignment, whether for domestic or export sale or use. Shipments of products purchased for resale are omitted. Shipments of products made under toll arrangements are included.

**Interplant transfers.** Shipments to other domestic plants within a company for further assembly, fabrication, or manufacture.

**Inventories.** The quantity or value of finished goods, work in progress, and materials on hand.

**Machinery in place.** The number of machines of a particular type in place as of a particular date whether the machinery was used for production, prototype, or sampling, or was idle. Machinery in place includes all machinery set up in operating positions.

**Net receipts.** Derived by subtracting the materials held at the end of the previous month from the sum of materials used during the current month.

**Production.** The total volume of products produced, including: products sold; products transferred or added to inventory after adjustments for breakage, shrinkage, and obsolescence, plus any other inventory adjustment; and products that undergo further manufacture at the same establishment.

**Quantities produced and consumed.** Quantities of each type of product produced by a company for internal consumption within that same company.

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**Quantity and value of new orders.** The sales value of orders received during the current reporting period for products and services to be delivered immediately or at some future date. Also represents the net sales value of contract change documents that increase or decrease the sales value of the orders to which they are related, when the parties concerned are in substantial agreement as to the amount involved. Included as orders are only those that are supported by binding legal documents such as signed contracts or letter contracts.

**Quantity and value of shipments.** The figures on quantity and value of shipments represent physical shipments of all products sold, transferred to other establishments of the same company, or shipped on consignment, whether for domestic or export sale. The value represents the net sales price, f.o.b. plant, to the customer or branch to which the products are shipped, net of discounts, allowances, freight charges, and returns. Shipments to a company's own branches are assigned the same value as comparable appropriate allocation of company overhead and profit. Products bought and resold without further manufacture are excluded.

**Stocks.** Total quantity of ending finished inventory.

**Unfilled orders (backlog).** Calculated by adding net new orders and subtracting net sales from the backlog at the end of the preceding year.

#### **HISTORICAL NOTE**

Data on selected electronic and associated products have been collected by the Census Bureau since 1961 on survey MA36N, Selected Electronics and Associated Products. In 1985, survey MA36N was divided into three annual surveys which are presently collected as: MA334P, Communication Equipment, Including Telephone, Telegraph, and Other Electronic Systems and Equipment; MA334Q, Semiconductors, Printed Circuit Boards, and Other Electronic Components; and MA334S, Electromedical Equipment and Irradiation Equipment (Including X-Ray). Historical data may be obtained from Current Industrial Reports available at your local Federal Depository Library.