

Selected Instruments and Related Products: 2003

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SUMMARY OF FINDINGS

During 2003, the total value of shipments of selected instruments and related products totaled \$72.9 billion, up 2.4 percent from the revised 2002 value of \$71.2 billion. The 2003 figure includes automatic regulating,

control, and solenoid valves, \$2.4 billion, down 8.5 percent from 2002; search, detection, navigation, guidance, aeronautical, and nautical systems, instruments, and equipment, \$32.0 billion, an increase of 6.9 percent from 2002; laboratory apparatus and furniture, \$2.1 billion, up 4.6 percent from 2002; controls for monitoring residential and commercial environments, and appliance regulating controls, \$2.3 billion, down 11.3 percent from 2002; process control instruments, \$5.8 billion, down 6.4 percent; fluid meters and counting devices including motor vehicle instruments, \$4.3 billion, down 4.1 percent from 2002; test equipment and instruments to measure electricity, \$8.7 billion, unchanged from 2002; the largest increase came in analytical and scientific instruments (except optical), \$7.9 billion, an increase of 8.6 percent from 2002; optical instruments and lenses, \$2.8 billion, a decrease of 0.6 percent from 2002; test equipment, instruments, and measuring and controlling devices, not elsewhere classified (n.e.c.), \$4.7 billion, unchanged from 2002.

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

Address inquiries concerning these data to Investment Goods Industries Branch, Manufacturing and Construction Division (MCD), Washington, DC 20233-6900, or call Jennifer Lee, 301-763-9057.

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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Economics and Statistics Administration
U.S. CENSUS BUREAU

Table 1. Value of Shipments of Selected Instruments and Related Products: 1998 to 2003
 [Millions of dollars]

Product class code	Product description	2003	2002	2001	2000	1999	1998
332911F	Automatic regulating and control valves.....	1,963.6	2,203.3	2,260.7	2,299.4	2,347.2	2,081.9
332911H	Solenoid-operated valves (except nuclear and fluid power transfer).....	468.3 r/	454.1	437.8	462.7	486.0	524.0
3345111	Aeronautical, nautical, and navigational instruments.....	2,338.6 r/	2,693.1	2,861.2	2,729.5	2,799.8	2,503.9
3345113	Search and detection, navigation and guidance systems and equipment	29,700.0 r/	27,272.2	29,340.0	27,165.3	24,597.7	26,030.5
3391110	Laboratory apparatus and laboratory furniture....	2,062.7	1,972.8	2,407.2	2,077.8	1,782.1	1,843.3
3345120	Controls for monitoring residential and commercial environments and appliance regulating controls.....	2,251.7	2,539.3	2,537.6	3,259.5	3,013.4	2,860.3
3345130	Process control instruments.....	5,813.7	6,213.0	6,698.0	7,311.3	6,825.4	6,637.0
3345141	Integrating and totalizing meters for gas and liquids.....	1,324.1 r/	1,232.8	1,094.5	1,062.5	1,081.0	1,147.2
3345143	Counting devices.....	437.1	446.8	413.7	511.5	391.3	394.0
3345145	Motor vehicle instruments.....	2,536.8	2,801.1	2,900.0	3,111.0	2,851.3	2,435.8
3345151	Integrating instruments, electrical.....	630.9	586.9	531.5	493.2	472.9	460.3
3345153	Test equipment for testing electrical, radio and communication circuits, and motors.....	7,651.1	7,682.5	10,628.0	13,982.0	11,034.0	10,453.9
3345155	Instruments to measure electricity.....	390.8	384.5	371.2	439.7	365.0	376.6
3345160	Analytical and scientific instruments (except optical).....	7,895.0	7,271.9	7,873.3	6,808.2	7,581.2	6,162.4
3333141	Sighting, tracking, and fire-control equipment, optical type.....	622.1 r/	607.9	512.1	432.5	534.3	509.8
3333143	Optical Instruments and lenses.....	2,144.7	2,174.4	2,302.9	2,698.5	2,354.4	2,068.0
3345192	Aircraft engine instruments (except flight).....	772.0	798.8	777.6	818.7	657.9	656.9
3345194	Physical properties and kinematic testing equipment.....	1,775.2 r/	1,703.5	1,718.1	1,845.3	1,736.4	1,728.1
3345195	Nuclear radiation detection and monitoring instruments.....	518.9	517.3	551.3	568.2	539.1	567.2
3345197	Commercial, geophysical, meteorological, and general purpose instruments	1,329.7	1,383.8	1,272.7	1,203.6	1,080.7	1,533.8
3345199	Surveying and drafting instruments	273.4 r/	255.2	289.8	331.7	313.7	297.3

r/Revised by 5 percent or more from previously published data.

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 2003 and 2002
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2003			2002				
			Quantity		Value	Quantity		Value		
332911F	Automatic valves (regulating and control type, except nuclear).....	158	(X)	b/	1,963,593	(X)	a/	2,203,303		
	Automated control valves:									
	Pneumatic actuated.....	(NA)	(X)		575,999	(X)		700,981		
	Sliding stem valves.....	(NA)	(S)		309,927	(S)		375,776		
332911F101	Globe body.....	29	189,382		210,621	a/	195,128	249,245		
332911F103	All other types.....	23	(S)		99,306	(S)		126,531		
	Rotary valves.....	(NA)	(S)		102,730	(S)		120,766		
332911F105	Ball.....	15	(S)	a/	46,021	(S)		52,691		
332911F107	Butterfly.....	12	33,883		41,358		36,511	44,983		
332911F109	All other rotary valves, including eccentric disk.....	12	b/	11,335	a/	15,351	b/	14,323	23,092	
332911F111	All other pneumatic power-operated control valves.....	15	(S)		26,382	a/r/	81,911	r/	30,508	
332911F113	Parts for pneumatic actuated valves, sold separately.....	28	(X)		136,960	(X)		173,931		
	All other actuation, including electric-actuated and electro-hydraulic actuated.....	(NA)	(X)		285,573	(X)	r/	288,016		
	Sliding stem valves.....	(NA)	(S)		58,299	(S)	r/	54,591		
332911F115	Globe body.....	11	8,268		6,248		7,842	5,851		
332911F117	All other types.....	14	213,715	a/	52,051		222,239	r/	48,740	
332911F122	Rotary valves, including ball, butterfly, and eccentric disk 1/ 2/.....	11	(D)		(D)		(D)	(D)		
332911F125	All other power-operated (except pneumatic) control valves 1/ 2/.....	14	4,857	a/	212,169		4,498	a/r/	217,038	
332911F127	Parts for all other power-operated (except pneumatic) control valves.....	13	(X)	a/	15,105		(X)	a/r/	16,387	
332911F129	Valve actuators, sold separately.....	22	a/	82,905		111,319	r/	98,983	117,803	
	Regulator valves:									
332911F131	Remote-sensing direct actuated temperature regulators 1/.....	20	(S)		55,858		(S)		69,838	
332911F133	Self-contained direct actuated pressure regulators (except instrument type and safety relief valves) 1/.....	37	4,211		241,747		4,455	r/	259,747	
332911F135	Pilot (internal and external) actuated pressure regulators 1/.....	32	a/	318	a/	104,208	a/r/	292	a/	112,998
332911F137	Self-contained direct-acting precision and instrument-type pneumatic (air and gas) pressure regulators 1/.....	13	311		31,939	r/	328	a/r/	34,825	
332911F139	Flow regulators for gas, vapors, or liquids 1/.....	43	b/	24,439	a/	212,859		26,074		240,700
332911F141	Other regulator valves 1/.....	29	c/	6,320	a/	262,791	a/	6,163		281,161
332911F143	Parts for regulator valves, sold separately.....	39	(X)		81,300		(X)	a/	97,234	
332911H	Solenoid-operated valves (except nuclear and fluid power transfer).....	45	(X)	a/	468,251		(X)	a/r/	454,127	
	Solenoid-operated valves (except power transfer valves):									
	Commercial/industrial types:									
332911H101	Two-way 1/.....	38	a/	5,375	a/	264,740	a/r/	5,361	a/r/	255,208
332911H103	Three-way 1/.....	18	763		37,491		830	a/	36,518	
332911H105	Other 1/ 3/.....	11	(D)		(D)		(D)		(D)	
332911H107	Household appliance type 1/ 3/.....	3	c/	6,990		129,482		6,764		123,188
332911H109	Parts, components, and operators for solenoid-operated valves (except nuclear and fluid power transfer valves, sold separately).....	20	(X)		36,538		(X)		39,213	
3345111	Aeronautical, nautical, and navigational instruments (except aircraft engine instruments).....	97	(X)	b/	2,338,603		(X)	r/	2,693,090	
	Flight and navigation sensors, transmitters, and displays:									
3345111101	Compasses (all types).....	17	(X)	c/	316,532		(X)	r/	451,149	
3345111103	Altimeters (except radio and radar altimeters).....	6	(X)	b/	43,496		(X)		33,272	
3345111105	Airspeed indicators, including machmeters and air data computers).....	22	(X)	a/	325,081		(X)		403,228	

Continued

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 2003 and 2002
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2003		2002	
			Quantity	Value	Quantity	Value
3345111107	Acceleration indicators and systems components	12	c/ 14,941	72,993	c/r/ 11,372	67,332
3345111109	Rate-of-climb indicators 4/.....	3	(D)	(D)	(D)	(D)
3345111111	Angle-of-attack indicators 4/.....	7	a/ 8,456	34,578	9,803	r/ 40,079
3345111113	Artificial horizon flight instruments	6	b/ 5,434	20,415	b/ 6,231	17,313
3345111115	Other aerospace and navigational instruments	32	(X)	690,561	(X) r/	790,015
	Gyroscopes, sold separately:					
3345111217	Vertical 5/.....	3	(S)	(D)	(S)	(D)
3345111219	Directional 5/.....	6	(S)	(D)	(S)	(D)
3345111221	Free, torqued and untorqued 5/.....	1	(X)	(D)	(X)	(D)
3345111223	Rate, inertial grade 5/.....	3	(X)	(D)	(X)	(D)
3345111225	Rate, noninertial grade 5/.....	3	(X)	205,295	(X) r/	150,999
	Airframe equipment instruments:					
3345111227	Position indicators (mechanical, as for landing gear, cowl flaps, stabilizers, etc.).....	8	(X)	15,660	(X) b/	30,975
3345111229	Hydraulic system (both electrical and mechanical measuring means, as for liquid level and temperature and pressure indicators).....	11	(X) a/	43,523	(X) b/	53,992
3345111231	Cabin environmental measuring and control instruments (air-conditioning and heating, cabin pressure, oxygen, etc.).....	8	(X)	57,683	(X)	69,687
3345111233	Other aerospace flight instruments.....	21	(X)	299,818	(X) r/	348,309
3345111335	Nautical instruments (all types, including temperature, speed, pitch, and roll instruments and system components, etc.).....	10	c/ 28,088	66,775	a/r/ 87,775	r/ 60,367
3345111437	Parts and components for aeronautical, nautical, and navigational instruments (except aircraft engine instruments, sold separately).....	25	(X) a/	146,193	(X) r/	176,373
33451113	Search and detection systems and navigation and guidance systems and equipment.....	233	(X) a/	29,699,976	(X) r/	27,272,230
3345113101	Light reconnaissance and surveillance electronic systems and equipment (infrared, ultraviolet, and visible light).....	40	(X)	3,553,049	(X) r/	2,678,613
3345113103	IFF equipment.....	11	(X)	337,112	(X) a/r/	350,875
3345113105	Proximity fuses.....	3	(X)	(D)	(X)	(D)
	Radar systems and equipment:					
	Search, detection, and acquisition radar systems and equipment (BMEWS, airborne and other early warning radar, air traffic control radar, air defense and fighter control radar, ship radar, harbor control radar, meteorological radar, etc.):					
3345113207	Airborne and missile/space radar.....	26	(X)	2,290,614	(X) r/	1,608,927
3345113209	Ship (marine) radar 6/.....	12	(X)	(D)	(X)	(D)
3345113211	Ground radar 6/.....	14	(X)	1,625,267	(X)	1,655,187
	Tracking radar systems and equipment (fire control, bombing, bombing-navigational radar, aircraft and missile tracking radar, etc.):					
3345113313	Airborne and missile/space radar 7/.....	8	(X)	(D)	(X)	(D)
3345113315	Ship (marine) radar 7/.....	8	(X)	(D)	(X)	(D)
3345113317	Ground radar.....	17	(X)	882,211	(X)	663,216
	Instrumentation radar systems and equipment altimeters, highway speed control radar, missile and space satellite tracking range radar, GCA and other precision approach radar, etc.):					
3345113319	Airborne, missile/space and ship (marine) radar.....	9	(X)	58,376	(X)	71,997
3345113321	Ground radar.....	3	(X) a/	152,516	(X) c/r/	102,684

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 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2003		2002	
			Quantity	Value	Quantity	Value
3345113323	Electronic checkout, monitoring, evaluation, and other electronic support equipment for radar systems.....	7	(X)	84,172	(X) r/	93,039
	Sonar search, detection, tracing and communication systems and equipment, including ASW (sonar telephone communication equipment, depth finding, fire control, fusing, guidance, hydrophones, mapping, sonabuys, navigation, sonar fish finders, sonar range instrumentation, and other):					
3345113425	Surface ship applications (destroyers, destroyer escorts, etc.) 7/.....	15	(X)	(D)	(X)	(D)
3345113427	Submarine applications.....	13	(X)	381,191	(X)	301,398
3345113429	Airborne 7/.....	11	(X)	3,974,495	(X)	3,304,136
3345113431	Electronic checkout, monitoring, evaluation, and other electronic support equipment for sonar systems and submerged fixed systems.....	4	(X)	(D)	(X)	(D)
3345113433	Specialized command and control data processing and display equipment, sold separately from complete systems.....	15	(X) a/	317,837	(X) a/r/	349,691
3345113434	Search, detection, identification, and tracking laser systems and equipment.....	1	(X)	(D)	(X)	(D)
3345113435	Search, detection, identification, and tracking systems and equipment, n.e.c.	29	(X)	1,515,086	(X)	1,401,452
	Electronic warfare systems and equipment:					
	Countermeasures equipment:					
3345113437	Jamming equipment, communications, and radar.....	20	(X)	2,268,103	(X)	2,133,376
3345113439	Underwater countermeasures equipment.....	3	(X)	(D)	(X)	(D)
3345113441	Other active countermeasures equipment, excluding passive materials such as chaff, window, needles, rope, etc.	8	(X)	41,306	(X) b/r/	91,807
3345113443	Specialized electronic and communication intelligence equipment, including specially designed DF equipment, signal reduction and processing equipment, and signal analyzers and display equipment.....	21	(X)	(D)	(X) a/	1,999,669
	Missile and space vehicle systems and equipment (beam riders, command guidance, inertial systems, infrared homing systems, radar systems, stellar trackers, television systems, combination systems, etc.):					
3345113545	Missile-borne and space-vehicle-borne equipment.....	36	(X)	3,477,862	(X) r/	4,454,893
3345113547	Nonmissile and space vehicle guidance equipment (ground, ship, or airborne command guidance systems, etc.).....	14	(X) a/	522,775	(X) r/	528,472
3345113549	Electronic checkout, launching, and other missile and space vehicle support systems (ground, ship, and air).....	15	(X) c/	689,483	(X) c/r/	583,611
	Navigation systems and equipment, navigational aids for aircraft, ship, and ground navigation (auto pilots, beacons, transponders, collision warning devices, DECCA, DME, ILS, Doppler navigation systems, inertial navigation systems, optical/laser LORAN, radio compasses and direction					

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 2003 and 2002
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2003		2002	
			Quantity	Value	Quantity	Value
	finders, SHORAN, TACAN, VOR, VORTAC equipment, etc.):					
	Airborne navigational systems:					
3345113651	Radio navigation receivers and displays, including OMNI, radio magnetic, glide slope/localizer, DME, etc.).....	22	(X) b/	602,683	(X) a/r/	628,842
3345113653	Airborne integrated data systems/ flight recorders.....	9	(X)	208,087	(X)	214,599
3345113655	Distance measuring equipment (DME) 8/.....	5	(X) (D)	(D)	(X) (D)	(D)
3345113657	Flight directors/situation display 8/.....	8	(X) (D)	(D)	(X) (D)	(D)
3345113659	Heads-up display (HUD) systems 8/.....	7	(X) (D)	(D)	(X) (D)	(D)
3345113661	Inertial navigation systems.....	10	(X)	577,082	(X)	481,830
3345113663	Proximity warning/collision avoidance equipment.....	7	(X)	363,085	(X) r/	518,071
3345113665	Complete automatic pilots 8/.....	7	(X) (D)	(D)	(X) (D)	(D)
3345113667	Other airborne navigational systems 8/.....	21	(X) c/	1,438,461	(X) r/	1,474,545
3345113669	Surface (ship and ground) navigational systems.....	30	(X) a/	355,632	(X)	348,826
3345113671	Underwater navigational systems.....	3	(X) (D)	(D)	(X) (D)	(D)
3345113673	Electronic checkout, monitoring, evaluation, and other electronic support equipment for navigational systems and equipment.....	33	(X) a/	623,748	(X) r/	467,652
3391110	Laboratory apparatus and laboratory furniture.....	152	(X) c/	2,062,685	(X) a/	1,972,777
3391110112	Laboratory balances and scales.....	8	(S)	33,488	(S)	33,561
3391110115	Laboratory furnaces and ovens.....	20	(X)	28,960	(X) r/	29,521
3391110118	Laboratory centrifuges.....	13	b/	23,792	a/	84,791
3391110121	Laboratory distillation apparatus and rectifying apparatus 9/.....	4	(X) (D)	(D)	(X) (D)	(D)
3391110125	Laboratory sterilizers and autoclaves.....	11	(X)	222,835	(X) r/	182,908
3391110129	Laboratory burners and hotplates.....	7	(X)	9,768	(X)	8,679
3391110133	Laboratory granulators, mills, and other particle size reduction apparatus.....	7	(X)	1,096	(X) r/	963
3391110135	Laboratory drying and evaporation apparatus.....	15	(X)	29,063	(X) r/	39,750
3391110137	Laboratory blenders, mixers, shakers, dispensers, fraction collectors, and other liquid sample preparation apparatus.....	25	(X) b/	135,966	(X) b/r/	160,070
3391110139	Laboratory incubators.....	11	c/	31,754	b/	34,864
3391110141	Environmental test chambers.....	21	c/	8,223	c/	134,898
3391110143	Laboratory freezers.....	11	b/	16,941	b/	8,817
3391110231	Laboratory furniture, including cabinets, cases, benches, tables, stools, reagent shelves, etc.....	17	(X) a/	338,545	(X) r/	298,133
3391110233	Parts and components for laboratory furniture, sold separately 9/.....	4	(X)	8,862	(X)	9,966
3391110151	All other laboratory apparatus, n.e.c.....	77	(X)	769,878	(X) a/	688,845
3391110155	Components, parts and accessories for laboratory and scientific apparatus, sold separately.....	50	(X)	142,911	(X)	140,560
3345120	Controls for monitoring residential and commercial environments and appliance regulating controls.....	108	(X) a/	2,251,672	(X)	2,539,349
	Automatic controls of the type principally used as components of air-conditioning, refrigeration, and comfort heating, including pneumatic controls:					
3345120102	Temperature responsive (thermostats) 1/.....	37	b/	43,015	a/	414,492
3345120105	Pressure responsive (pressurestats) 1/.....	10		1,356		10,897
3345120107	Hydronic responsive 1/ 10/.....	6	(D)	(D)	(D)	(D)
3345120109	Humidity responsive (humidistats) 1/ 10/.....	5	(D)	(D)	(D)	(D)
3345120111	Light responsive 1/ 10/.....	1	c/	5,272	c/	31,940
3345120113	Liquid level 1/.....	11	(S)	47,547	(S)	47,547
3345120115	Igniters 1/ 11/.....	8	(D)	(D)	(D)	(D)
3345120117	Inherent motor protectors 1/ 11/.....	4	a/	107,929		356,138

Continued

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 2003 and 2002
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2003			2002				
			Quantity		Value	Quantity		Value		
3345120219	Microprocessor-based load programmers for buildings energy control 1/.....	11	(S)	b/	63,965	(S)	b/	51,270		
3345120221	Computerized energy control systems for buildings.....	11	b/	920,748	a/	280,071	r/	860,318	a/	249,965
3345120222	Lighting controls, including occupancy and motion sensors, lighting control panels, dimming control systems, timing devices, etc. 10/.....	3	(D)		(D)		(D)		(D)	
3345120223	Other.....	25	(X)		518,557	(X)		707,540		
	Controls for major appliances such as domestic laundry and cooking appliances, refrigerators and freezers, vending machines, air conditioners, etc.:									
3345120225	Temperature responsive 1/.....	14		99,398	b/	219,094		85,297		225,493
3345120227	All other controls for appliances 1/.....	15		47,098		236,545		63,594		282,375
3345120229	Parts and components for controls monitoring residential and commercial environments and for appliance regulating controls, sold separately.....	23	(X)		72,426	(X)	r/	109,280		
3345130	Process control instruments.....	511	(X)	b/	5,813,748	(X)	a/	6,212,978		
	General-purpose control system instruments (commonly call receiver-type), operating from standardized transmission signals (electrical types ac or dc milliampere, millivolt, or telemetering signals; pneumatic types, 3 to 15 and 3 to 27 p.s.i. signals):									
	Electronic systems - unified architecture type:									
3345130101	Controllers (recording, indicating, or blind).....	32	c/	472,551		616,046	c/r/	473,429	r/	612,989
3345130103	Recorders, with or without self-contained set-point stations.....	9	c/	81,347	b/	54,024	c/	84,379	r/	58,531
3345130105	Indicators, with or without self-contained set-point stations.....	17	(S)	a/	15,802	(S)	r/	16,030		
3345130107	Auxiliary stations and analog computing devices associated with the above, including manual loaders, auto-to-manual stations, ratio stations, adders, multipliers, integrators, etc.	7	(S)		112,153	(S)		118,892		
3345130109	Electronic systems - nonunified architecture type.....	58	(X)	a/	688,511	(X)	b/r/	835,126		
3345130111	Industrial multifunction process computers.....	45	(X)	a/	290,693	(X)	a/	387,340		
	Pneumatic systems, including all system-type control, display and computing instruments actuated from standardized pneumatic transmission signals:									
3345130113	Controllers (recording, indicating, or blind) 12/13/.....	10	(S)		25,610	(S)	r/	42,061		
3345130116	Recorders and indicators, with or without self-contained set-point stations 12/13/...	6	(D)		(D)	(D)		(D)		(D)
3345130119	Auxiliary stations and analog computing devices associated with the above, including manual loaders, auto-to-manual stations, ratio stations, adders, multipliers, integrators, etc. 12/13/	2	(S)		(D)	(S)		(D)		(D)
3345130121	Receiver-type gauges, analog and digital 13/.....	5	(D)	a/	7,527	(D)		(D)		(D)
3345130123	Annunciators, industrial; electro-mechanical and solid-state types.....	7	a/	35,485	b/	21,606	a/	31,020	b/	19,541
	Temperature measuring instruments, excluding general-purpose receiver-type instruments:									
	Electrical and electronic measuring types (thermocouple, resistance									

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 2003 and 2002
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2003			2002		
			Quantity	Value	Quantity	Value		
3345130225	temperature detector, radiation, optical, thermistor, and other electrical sensors): Direct-deflecting types (controllers for all types of electrical temperature sensors) 14/.....	4	(S)	(D)	(S)	(D)		
3345130227	Direct-deflecting types (indicators and recorders for all types of electrical temperature sensors) 14/.....	5	(S)	b/ 13,871	(S)	b/ 14,360		
3345130231	Electromechanical self-balancing types (indicators, recorders, and integrators for all types of electrical temperature sensors).....	3	(S)	a/ 5,057	(S)	a/ 4,247		
3345130233	Electronic controllers for all types of electrical temperature sensors.....	23	a/ 586,298	a/ 128,840	b/ 595,237	a/ 127,860		
3345130235	Digital indicators for all types of electrical temperature sensors, excluding data loggers.....	26	a/ 51,528	b/ 15,530	b/ 43,047	b/r/ 14,613		
3345130237	Transmitters, producing standardized electric or pneumatic analog transmission signals for all types of electrical temperature sensors: Electric 15/.....	17	c/ 101,671	43,837	c/r/ 119,496	r/ 47,631		
3345130239	Pneumatic 15/.....	2	(D)	(D)	(D)	(D)		
3345130241	Mechanical measuring types, filled systems (liquid filled, vapor pressure, gas filled, and mercury filled types): Indicating or recording controllers.....	8	(S)	10,538	(S)	r/ 10,162		
3345130243	Recorders, noncontrol.....	12	(S)	11,165	(S)	r/ 11,167		
3345130245	Indicators only, excluding indoor-outdoor and other household or appliance type thermometers.....	10	383,984	a/ 9,468	374,708	a/ 9,269		
3345130247	Transmitters producing standardized electric or pneumatic analog transmission signals.....	10	b/ 10,337	b/ 4,286	a/r/ 13,632	a/ 5,665		
3345130249	Primary temperature sensors, excluding aircraft types: Thermocouples and thermocouple lead wire.....	54	(X)	a/ 209,250	(X)	a/ 209,395		
3345130251	All other types (resistance temperature detectors, radiation and optical sensors, thermistors, etc.).....	45	(X)	127,719	(X)	a/r/ 136,997		
3345130253	Pressure (gauge, absolute vacuum) and draft measuring instruments, excluding general-purpose receiver-type instruments: Indicating or recording controllers 16/.....	18	a/ 801,826	b/ 98,954	a/ 805,244	b/r/ 95,517		
3345130255	Recorders, noncontrol 16/.....	8	(D)	(D)	(D)	(D)		
3345130257	Indicators only, excluding receiver-type gauges: 3-inch diameter and over 1/.....	18	4,130	81,213	3,899	85,110		
3345130259	Under 3-inch diameter 1/.....	15	26,592	76,672	26,347	74,695		
3345130261	Transmitters producing standardized analog transmission signals: Transmitters producing standardized electronic analog transmission signals 1/ 17/.....	27	a/ 1,142	154,812	a/ 1,094	a/ 173,506		
3345130263	Transmitters producing standardized pneumatic analog transmission signals 17/.....	3	(D)	(D)	(D)	(D)		
3345130265	Flow and liquid level measuring instruments, excluding general-purpose receiver-type instruments: Differential pressure types: Indicating or recording controllers.....	6	125,810	11,299	134,522	r/ 12,411		
3345130267	Recorders, noncontrol, and indicators, noncontrol.....	9	72,025	26,280	79,485	a/ 27,961		

Continued

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 2003 and 2002
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2003		2002	
			Quantity	Value	Quantity	Value
3345130269	Transmitters producing standardized analog transmission signals:					
	Transmitters producing standardized electronic analog transmission signals 18/.....	15	c/ 251,781	286,102	c/ 269,204	r/ 297,208
3345130271	Transmitters producing standardized pneumatic analog transmission signals 18/.....	4	(D)	(D)	(D)	(D)
3345130273	Primary pressure sensors (load cells, strain gauges, etc.).....	9	30,609	12,651	30,594	13,426
3345130275	Primary flow elements, including orifice plates, venturi tubes, low tubes, flow nozzles, pitot tubes, etc.	18	241,193	54,936	245,743	61,893
	Electromagnetic flowmeters:					
3345130277	Primary device (magnetic flow tube).....	12	b/ 70,758	51,108	b/ 71,258	r/ 50,532
3345130279	Secondary device (magnetic transmitter, recorder, indicator or controller which receives signal directly from primary device).....	9	c/ 34,455	25,063	c/ 33,162	23,029
3345130281	Capacitance, ultrasonic, and other electronic types, including magnetic resonance, vortex-precession, and vortex-shedding type elements.....	34	c/ 132,882	b/ 126,783	b/r/ 145,289	b/r/ 137,153
3345130283	Variable area-controlling, recording, indicating, and transmitting instruments and associated primary flow elements 1/.....	14	(S)	106,317	(S)	b/ 78,544
3345130285	Float and displacement (controlling, recording, indicating, and transmitting instruments and associated primary flow elements) 1/.....	26	a/ 1,813	106,730	b/ 1,786	a/r/ 101,426
3345130287	Turbine and propeller: controlling, recording, indicating, and transmitting instruments and associated primary flow elements.....	12	b/ 107,151	b/ 37,328	b/r/ 110,740	b/r/ 37,382
3345130289	Mass flow, i.e., controlling, thermal-controlling, recording indicating, and transmitting instruments and associated primary flow elements.....	14	87,650	232,077	87,854	r/ 244,900
3345130291	Other types: controlling, recording, indicating, and transmitting instruments and associated primary flow elements.....	16	c/ 824,187	a/ 143,318	a/r/ 802,783	a/r/ 156,764
3345130293	Humidity instruments (controlling, recording, indicating, and transmitting, and associated primary humidity elements, excluding home and general-purpose type).....	10	c/ 68,635	c/ 34,701	c/ 63,276	b/r/ 30,607
	Continuous process instruments for on-stream gas and liquid analysis, including indicators, recorders, controllers, and analysis electrodes and cells, excluding laboratory analysis types:					
3345130295	Chromatographic analyzers.....	13	c/ 4,273	49,381	c/r/ 3,906	b/r/ 62,361
3345130297	Infrared analyzers.....	11	(S)	c/ 10,822	(S)	r/ 13,134
3345130299	Oxygen analyzers.....	20	b/ 37,152	b/ 72,269	b/ 34,090	74,332
334513021A	Other gas analyzers.....	24	b/ 66,867	c/ 105,125	b/ 62,185	116,909
334513021C	Ph analyzers.....	11	199,411	29,292	b/r/ 229,174	a/ 41,721
334513021E	Other liquid analyzers.....	23	c/ 120,309	b/ 88,364	c/ 120,722	b/ 94,393
	Instruments for all process variables not listed above (speed, weight, position, sequence, density, specific gravity, mechanical load, electrical load, millivolts):					
	Electrical and electronic measuring types:					
334513011G	Direct-deflecting type controllers, indicators, and recorders.....	7	(S)	c/ 28,021	(S)	28,589

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 2003 and 2002
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2003			2002				
			Quantity		Value	Quantity		Value		
334513021L	Digital indicators.....	15	a/	67,384	a/	34,842	b/r/	49,401	a/r/	37,581
334513021M	Transmitters producing standardized electric or pneumatic analog transmission signals.....	7	c/	31,907	b/	8,020	c/r/	41,875	b/r/	10,979
334513021P	Mechanical measuring types: Indicating or recording controllers and recorders, noncontrol.....	4		(S)		1,333		(S)		2,129
334513021R	Indicators only.....	5		(S)		11,915		(S)		11,899
334513021T	Transmitters producing standardized electric or pneumatic analog transmission signals.....	13		(S)		45,964		(S)		46,450
	All other industrial process instruments:									
334513022A	Other temperature instruments.....	26		(X) b/		137,537		(X) a/		145,494
334513022C	Other flow and liquid level instruments.....	27		(X) b/		214,267		(X) b/		223,853
334513022E	Other continuous process instruments.....	34		(X) a/		178,603		(X) a/		202,297
334513022G	Other industrial type instruments.....	53		(X)		470,763		(X) r/		467,924
	Parts, supplies, accessories, other primary sensors, n.e.c., panelboards, and other equipment associated with process control instrumentation:									
334513032J	Primarily designed for temperature instruments.....	16		(X)		31,414		(X) r/		33,165
334513032L	Primarily designed for flow and liquid level instruments.....	28		(X)		94,086		(X) r/		87,713
334513032N	Primarily designed for continuous process instruments.....	19		(X) a/		47,952		(X) r/		50,565
334513032P	Primarily designed for industrial type instruments.....	32		(X) b/		75,901		(X) b/		77,550
3345141	Integrating and totalizing meters for gas and liquids.....	45		(X)		1,324,099		(X) r/		1,232,767
	Gas meters, consumption registering: Diaphragm type; positive displacements; aluminum, iron, and tin case:									
3345141101	Residential size (up to 400 cu. ft/hr of 0.64 specific gravity gas, at 0.5 inches water drop) 1/ 19/.....	5		(S)		(D)		(S)		(D)
3345141103	Other sizes, including commercial and industrial 19/.....	6		(S)		(D)		(S)		(D)
3345141105	Turbine type (all sizes).....	4	a/	3,998	a/	11,928	b/	5,492	b/	17,935
3345141107	Other gas meters, consumption registering 19/.....	5		(S) a/		209,312		(S) a/r/		183,611
	Liquid meters, positive displacement with registers and counters:									
	Water meters, consumption registering:									
3345141109	Small meters, up to and including 1 inch 1/.....	10		5,413		300,065	r/	5,485	r/	290,329
3345141111	Intermediate meters, over 1 inch, up to and including 2 inch.....	10		173,394		43,794	r/	164,497	r/	41,520
3345141113	Large meters, over 2 inch.....	11		(S)		122,810		(S) r/		124,462
3345141115	Liquid fuel dispensing meters, excluding service station dispensing pumps 20/.....	8		(D)		(D)		(D)		(D)
3345141117	Other liquid meters; industrial bulk plants, pipeline, batching, and treatment facilities 20/.....	14	c/	1,172,391		243,935	c/	1,071,924	r/	235,530
3345141119	Parts, components, and accessories for gas and liquid meters, sold separately.....	34		(X)		392,255		(X) r/		339,380
3345143	Counting devices, excluding motor vehicle instruments.....	39		(X) a/		437,065		(X) a/		446,820
3345143101	Mechanical input 1/.....	9		(S)		32,258		(S) c/r/		24,404
3345143103	Electrical input 1/.....	11	c/	743	a/	30,271	c/	829	c/	50,681
3345143105	Electronic input.....	14		3,193,967	a/	100,066		(S)		109,155

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 2003 and 2002
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2003		2002	
			Quantity	Value	Quantity	Value
3345143107	All other counting devices not specified above, including toll meters, fare collection equipment (systems), parking lot systems, etc., but excluding parking meters.....	11	(X) a/	267,677	(X)	258,735
3345143109	Components and parts for counting devices (except parking meters), sold separately.....	8	(X)	6,793	(X) b/r/	3,845
3345145	Motor vehicle instruments.....	31	(X) a/	2,536,810	(X)	2,801,072
3345145101	Speedometers (speedometers, including odometers, are classified as speedometers).....	9	(X)	11,268	(X) r/	10,794
3345145103	Tachometers.....	8	(X)	18,454	(X) r/	24,355
3345145105	Odometers (speedometers, including odometers, are classified as speedometers) 21/.....	4	(X)	(D)	(X)	(D)
3345145107	Fuel level gauges 21/.....	7	(X)	7,700	(X)	47,376
3345145109	Water temperature gauges.....	9	(X)	19,124	(X) r/	17,643
3345145111	Ammeters.....	8	(X)	1,666	(X) a/r/	1,104
3345145113	Oil pressure gauges.....	7	(X)	7,335	(X) r/	4,149
3345145115	Instrument panels, including cluster modules.....	16	(X)	2,389,204	(X)	2,622,138
3345145117	Other motor vehicle instruments.....	19	(X)	82,059	(X) r/	73,513
3345151	Integrating instruments, electrical.....	22	(X) a/	630,872	(X)	586,904
	Ac watt-hour meters:					
3345151101	Single phase 1/.....	7		6,484	5,248	197,059
3345151103	Polyphase.....	4	a/	55,816	b/	239,700
3345151105	Demand meters (kW and kVA), combined watt-hour and demand meters (single phase and polyphase), and combined watt-hour and time switch meters.....	10		942,476		140,980
3345151107	Other electrical integrating meters, including dc watt-hour meters, ampere-hour meters, and other miscellaneous integrating instruments not included in the above classifications.....	12	(X) a/	159,842	(X) a/r/	160,018
3345151109	Parts and accessories for electric integrating meters, including meter mountings and registers, sold separately.....	10	(X)	40,662	(X)	49,074
3345153	Test equipment for testing electrical, radio and communication circuits, and motors.....	323	(X) a/	7,651,134	(X)	7,682,502
	Voltage, current, and resistance measuring equipment (except multimeters):					
	Electronic:					
3345153101	Digital.....	21	(X) a/	76,453	(X) a/r/	70,305
3345153103	Analog.....	20	(X) a/	31,751	(X) a/r/	48,907
3345153105	Electrical, excluding panel meters 22/.....	13	(X)	(D)	(X)	(D)
	Multimeters:					
3345153107	Electronic, digital and analog 22/.....	10	(X) c/	278,765	(X) r/	263,892
3345153109	Electrical 22/.....	3	(X)	(D)	(X)	(D)
	Power and energy measuring equipment:					
3345153114	Electronic, digital and analog.....	12	(X) c/	63,358	(X) a/r/	67,396
3345153115	Electrical power measuring equipment, excluding electrical integrating instruments, sold separately 23/.....	2	(X)	(D)	(X)	(D)
3345153118	Frequency counters, timers, and other frequency and time measuring equipment, excluding standards.....	17	(X)	59,026	(X) r/	80,398
3345153126	Waveform measuring and/or analyzing equipment, including oscilloscopes and spectrum analyzers.....	21	(X) b/	523,763	(X) r/	505,627
	Signal generating equipment:					
3345153131	Audio.....	11	(X) a/	17,424	(X)	14,453
3345153133	RF (over 20 kHz to 890 MHz).....	14	(X)	68,602	(X)	69,224
3345153135	Microwave (890 MHz and above).....	7	(X) b/	48,473	(X) b/r/	52,659

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Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 2003 and 2002
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2003		2002	
			Quantity	Value	Quantity	Value
	Field strength and intensity measuring equipment, including RFI measuring equipment:					
3345153137	Electronic.....	13	(X) c/	100,420	(X) a/r/	88,111
3345153139	Electrical field measuring equipment 24/.....	4	(X)	(D)	(X) c/	6,883
	Impedance and standing wave ratio measuring equipment (transfer function measuring equipment):					
3345153143	Electronic impedance and related measuring equipment 24/.....	5	(X) a/	25,906	(X) a/r/	7,770
	Automatic test and measuring equipment:					
3345153149	Combination and/or group test sets.....	44	(X)	1,413,114	(X)	1,218,177
	Component part test sets:					
3345153151	Electron tube test equipment 23/.....	1	(X)	(D)	(X)	(D)
	Semiconductor component test equipment:					
3345153153	Memory.....	11	(X) a/	25,836	(X) a/r/	25,667
3345153155	Linear 25/.....	6	(X)	(D)	(X)	(D)
3345153157	Microprocessor.....	12	(X)	336,108	(X)	273,331
3345153159	Other semiconductor component test equipment 25/.....	35	(X) a/	1,615,628	(X) r/	1,447,911
3345153161	Circuit board loaded test equipment.....	12	(X) a/	199,620	(X) a/r/	175,435
3345153163	Other component part test sets and equipment.....	19	(X)	90,607	(X) r/	98,958
3345153165	Equipment and subassembly test equipment, n.e.c., including disc drive testers, power supply testers, etc.	13	(X) a/	121,033	(X) a/	131,586
3345153168	Standards and calibration equipment for test measuring equipment, including laboratory types (metered bench top, rack-mountable, or plug-in equipment).....	22	(X) c/	202,636	(X) a/r/	210,321
	Analyzers for testing characteristics of internal-combustion engines, excluding aircraft:					
3345153171	Portable.....	4	(X)	(D)	(X)	175,000
3345153173	Other.....	4	(X) c/	12,794	(X)	(D)
	Communications test equipment, n.e.c.:					
3345153175	Network analyzers.....	13	(X)	528,464	(X) r/	749,473
3345153177	Cable backplane and other continuity testers.....	10	(X) b/	15,762	(X) a/	15,800
3345153179	Fiber optics test equipment (OTDR, optical S/N meters, etc.).....	10	(X)	387,308	(X)	432,949
3345153181	Other communications test, monitoring, and control equipment (except microwave).....	26	(X) b/	226,597	(X) a/r/	241,348
3345153183	Microwave test equipment, n.e.c., (1,300 MHz and above).....	9	(X) a/	95,099	(X)	98,754
	Logic test, development, and analysis equipment:					
3345153185	Logic analyzers, and similar logic state, timing, and signature analyzers.....	5	(X)	(D)	(X)	(D)
3345153187	Microprocessor development systems.....	5	(X) a/	1,864	(X) c/r/	22,578
3345153189	Pulse, function, and data generators and similar metered frequency synthesizers.....	11	(X)	82,007	(X) r/	200,513
3345153191	Other field service test and measurement equipment, logic probes, clips, and pulsers.....	8	(X) c/	28,954	(X)	23,647
3345153193	Other measuring and checking instruments for testing electrical, radio and communication circuits, and motors.....	30	(X) a/	342,158	(X) r/	328,279
3345153195	Other analyzing instruments for checking electrical quantities 23/.....	10	(X) c/	84,552	(X)	124,573

Continued

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 2003 and 2002
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2003				2002			
			Quantity		Value		Quantity		Value	
3345153197	Parts and components for test equipment for testing electrical, radio and communication circuits, and motors, sold separately.....	43	(X)	b/	205,724	(X)	b/r/	220,529		
3345155	Instruments to measure electricity.....	79	(X)	b/	390,827	(X)	a/	384,537		
3345155101	Electrical indicating instruments: Panel type instruments: Digital panel meters (DPM) between 0.05 percent and 1 percent, plus or minus one-digit accuracy, excluding precision DVM's and electronic counters.....	18	c/	324,907	b/	36,801	c/r/	332,353	b/r/	37,448
3345155103	Analog solid state panel meters (generally of plus or minus 2-percent accuracy) with LED, LCD, or neon gas discharge display.....	7	b/	7,741	a/	1,848	b/r/	9,141	a/	2,415
3345155105	Panel types other than ruggedized or sealed (generally of 2-percent accuracy): Ac, including moving iron vane and dynamometer types.....	6	a/	94,500	b/	2,101	a/r/	111,051	a/r/	2,485
3345155107	Dc, including rectifier and self-contained thermocouple types 1/.....	11	c/	566	b/	15,703	c/r/	668	b/	20,346
3345155109	Panel types ruggedized or sealed (generally of 2-percent accuracy).....	6	(S)	c/	8,744	(S)	a/	5,784		
3345155113	All other panel type instruments, including ammeters and voltmeters for motor vehicles 1/.....	13	(S)	b/	52,872	a/	1,328	b/	53,695	
3345155116	Switchboard instruments which are generally of 1-percent accuracy, including a.c. and d.c. 26/.....	4	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
3345155119	Elapsed time meters (with and without reset) 1/ 26/.....	7	(D)	c/	18,383	(D)	c/r/	13,054		
3345155121	Portable instruments which are generally capable of accuracies within plus or minus 2 percent of full scale indication, and can be enclosed in a case so that they can be moved and used at various locations, and which are an end product.....	16		514,421		106,246		482,204		104,597
3345155124	Electrical recording instruments (portable and for panel mounting), including oscillographic and direct deflecting types.....	20		18,083		88,073	r/	18,554		82,219
3345155129	Parts and accessories for indicating and recording instruments: Transducers for volts, amperes, watts, vars, frequency, temperature and power factor.....	18	(X)	a/	24,188	(X)	a/r/	22,892		
3345155133	Other, including instrument shunts.....	15	(X)		35,868	(X)	r/	39,602		
3345160	Analytical and scientific instruments (except optical).....	291	(X)	a/	7,894,999	(X)	a/	7,271,942		
3345160101	Electrochemical instruments: Ph electrodes and meters.....	18	(X)	b/	86,438	(X)	a/	96,604		
3345160103	Ion selective electrodes and meters.....	11	(X)	c/	52,217	(X)	a/	58,161		
3345160107	Electrophoresis instruments.....	12	(X)		363,199	(X)		102,277		
3345160109	Other (except process type), including photometers.....	9	(X)		20,664	(X)	r/	20,146		
3345160112	Chromatographic instruments, including gas, liquid, paper, gel, and thin layer.....	42	a/	171,652		965,473	c/r/	193,557	r/	952,738
3345160117	Spectrophotometric instruments: Atomic absorption.....	5	(X)	b/	13,155	(X)	r/	31,023		
3345160119	Optical emission, including spark, arc, and glow, spectrographs, all other (except ICP).....	6	(X)	a/	21,267	(X)	a/	10,973		

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Product code	Product description	No. of cos.	2003			2002				
			Quantity	Value	Quantity	Value				
3345160121	Optical emission, including laser excited source, which includes laser microprobe source emission, laser source Raman, and laser microprobe source Raman spectrometers.....	6	(X) c/	73,382	(X) r/		54,756			
3345160123	Optical emission with inductively coupled plasma, ICP.....	5	(X) b/	87,904	(X)		47,334			
3345160125	Infrared including Fourier transfer methods.....	17	(X) a/	132,408	(X) a/		120,173			
3345160127	Ultraviolet, visible and colorimeters.....	24	(X) a/	158,557	(X)		144,703			
3345160129	Fluorescent instruments, including fluorometers (except chemicals).....	15	(X)	73,883	(X)		56,250			
3345160131	Color measuring devices.....	8	(X)	172,392	(X)		155,191			
3345160133	Other, including vacuum ultraviolet, Raman, light scattering reflectors, helium glow, and light measuring.....	13	(X)	35,550	(X) r/		38,149			
3345160135	Thermal analysis instruments, including thermogravimetric analyzers (TGA), quantitative thermal analyzers (QTA) and differential thermal analyzers (DTA).....	11	(X)	149,504	(X) r/		115,593			
3345160137	Nuclear magnetic resonance spectrometers, including electron paramagnetic spin types (EP) 27/28/.....	3	(D)	(D)	(D)		(D)			
3345160139	Microscopes, scanning type, including electron and proton 27/28/.....	4	(D)	(D)	(D)		(D)			
3345160141	Particle beam excitation instruments, including electron microprobes, augers, energy ion spectrometers, secondary ion mass spectrometers (SIMS), ion microprobes 27/28/.....	2	(D)	283,957	(D)		(D)			
3345160143	Photon excitation analyzers, including: X-ray fluorescence, simultaneous; X-ray fluorescence, sequential; X-ray fluorescence, sequential with diffraction; X-ray fluorescence, diffraction; X-ray diffraction; and energy dispersive systems (EDSs).....	7	b/	917	48,844	b/r/	901	r/	50,481	
3345160145	Mass spectroscopy instrumentation.....	17	(X)	547,357	(X)		407,124			
3345160147	Clinical laboratory instrumentation, including instruments used in the clinical laboratory for measuring, analyzing, and processing clinical specimens.....	(NA)	(X)	1,623,986	(X)		1,245,018			
3345160149	Chemistry (measure and identify substances, e.g., metabolites, enzymes, and drugs).....	13		742,710		677,031		543,049		
3345160151	Hematology (measure and identify substances or cells contained in blood or substances influencing the development and clotting of blood, e.g., cell counting coagulation factors).....	11	c/	35,762	a/	530,533	22,136		315,938	
3345160153	Microbiology (enumerate or identify pathogenic organisms or measure their susceptibility to anti-microbial agents).....	8	(S) a/	113,411	(S) r/		87,897			
3345160155	Histology (process tissue and cells, e.g., tissue processors, cell stainers) 28/.....	3	(S)	10,123	(D)		(D)			
3345160157	Blood bank and immunology (process blood and specimens for testing; measure and identify, using immunoassay, substances in clinical specimens).....	7	a/	4,096		5,250		196,103		
3345160159	Other clinical laboratory instrumentation not specified above.....	12	b/	17,838		138,757	b/	18,724	r/	110,235
3345160159	Organic elemental analysis instruments, including carbon, hydrogen, nitrogen, oxygen, and sulphur.....	14		27,883		112,183	b/	24,918	a/	87,133

Continued

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 2003 and 2002
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2003		2002			
			Quantity	Value	Quantity	Value		
3345160161	Amino acid, protein and/or peptide, including chromatographic type 28/.....	8	(S)	140,920	(D)	(D)		
3345160163	Gas detectors.....	20	b/	522,545	a/	143,330		
3345160164	Analytical and scientific laser systems and equipment 28/.....	5	(D)	25,125	(D)	(D)		
3345160165	Other analytical and scientific instruments, n.e.c., including molecular weight, monochrometers (analytical type), nephelometers (except meteorological), osmometers, particle size analyzers, photo multipliers, surface area analyzers, turbidimeters, and breatholyzers 28/.....	91	(X)	1,556,900	(X)	2,215,456		
3345160167	Parts, components, and accessories for analytical and scientific instruments, sold separately, including photo tubes, thermal conductivity sensors, thermopiles, etc.	106	(X)	a/	1,006,404	(X)	a/r/	1,121,180
3333141	Sighting, tracking, and fire control equipment optical type.....	41	(X)	a/	622,113	(X)	r/	607,916
3333141101	Made from lenses, prisms, etc., produced in the same plant.....	9	(X)	288,784	(X)	r/	248,652	
3333141103	Made from purchased lenses, prisms, etc.	19	(X)	b/	232,875	(X)	r/	227,085
3333141104	Sighting and tracking laser systems and equipment 29/.....	5	(X)	a/	63,878	(X)	(D)	
3333141105	Parts and accessories 29/.....	15	(X)	b/	36,576	(X)	b/r/	132,179
3333143	Optical instruments and lenses.....	165	(X)	a/	2,144,705	(X)	2,174,407	
3333143111	Binoculars, prismatic and nonprismatic, terrestrial and celestial telescopes.....	14	(X)	c/	74,018	(X)	r/	65,980
3333143113	Other astronomical instruments, excluding radio astronomy.....	5	(X)	4,636	(X)	r/	4,200	
3333143115	Parts and accessories, including mountings for binoculars, optical telescopes and other astronomical equipment.....	12	(X)	b/	25,811	(X)	r/	29,950
3333143231	Optical test and inspection equipment, including standard sources, modulators, optical comparators, interferometers (except optical microscopes).....	34	(X)	a/	188,086	(X)	218,334	
3333143233	Optical microscopes.....	11	(X)	b/	30,224	(X)	26,324	
3333143235	Optical components: Filters, including parts and accessories thereof.....	28	(X)	b/	92,201	(X)	107,201	
3333143237	Lenses (except ophthalmic focus lenses): Unmounted lenses.....	38	(X)	a/	234,079	(X)	a/r/	250,480
3333143242	Mounted lenses, including photographic....	17	(X)	275,700	(X)	307,227		
3333143243	Other (prisms, mirrors, etc.).....	47	(X)	b/	156,716	(X)	r/	179,878
3333143245	Other optical instruments, including optical alignment and display instruments; excluding analytical instruments and binoculars and astronomical instruments listed above, and sighting and fire control equipment.....	42	(X)	a/	866,722	(X)	a/r/	765,037
3333143247	Parts and accessories for other optical microscopes.....	9	(X)	b/	8,351	(X)	a/r/	20,822
3333143249	Parts and accessories for other optical instruments.....	23	(X)	188,161	(X)	r/	198,974	
3345192	Aircraft engine instruments (except flight).....	40	(X)	a/	772,032	(X)	a/	798,761
3345192101	Temperature sensors, transmitters, and displays.....	21	(X)	313,993	(X)	b/r/	325,529	
3345192103	Pressure ratio sensors, displays, and controls 30/.....	4	(X)	(D)	(X)	(D)		
3345192105	Pressure and vacuum sensors, transmitters, and displays.....	10	(X)	52,346	(X)	57,671		

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 2003 and 2002
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2003		2002	
			Quantity	Value	Quantity	Value
3345192107	Fuel and oil flow rate sensors, transmitters, and displays, including mixture controls.....	7	(X)	34,077	(X)	32,609
3345192109	Fuel and oil quantity sensors, transmitters, and displays, including densitometers 30/.....	7	(X)	(D)	(X)	(D)
3345192111	Tachometer generators and indicators.....	8	(X)	11,074	(X)	8,077
3345192113	All other not specified above.....	14	(X)	191,593	(X)	a/r/ 200,174
3345192115	Parts and components for aircraft engine instruments (except flight), sold separately 30/.....	11	(X)	168,949	(X)	c/r/ 174,701
3345194	Physical properties testing and inspection equipment and kinematic testing and measuring equipment.....	152	(X)	a/ 1,775,215	(X)	a/r/ 1,703,506
	Physical properties testing equipment, including hardness, tensile, stress, strain, abrasion, strength, torsion, wear, and similar testing equipment, including components and sold separately:					
3345194101	For testing of metals.....	24	(X)	461,098	(X)	485,313
3345194103	Other.....	43	(X)	473,771	(X)	r/ 440,152
3345194105	Parts for physical properties testing equipment, sold separately.....	22	(X)	b/ 21,746	(X)	b/ 18,789
	Physical properties inspection equipment, including flaw detection, thickness measuring, and similar inspection equipment, including components and parts, sold separately:					
3345194107	For testing of metals.....	20	(X)	a/ 202,577	(X)	174,004
3345194109	Measuring and checking flow of fluids.....	14	(X)	c/ 75,084	(X)	c/ 74,573
3345194111	Other.....	35	(X)	b/ 276,527	(X)	r/ 254,343
3345194113	Parts for physical properties inspection equipment, sold separately.....	22	(X)	b/ 55,234	(X)	b/r/ 49,778
3345194115	Kinematic testing and measuring equipment, including vibration, acceleration, and other motion testing equipment.....	31	(X)	b/ 204,814	(X)	r/ 202,112
3345194117	Parts for kinematic testing and measuring equipment, sold separately.....	6	(X)	c/ 4,364	(X)	b/r/ 4,442
3345195	Nuclear radiation detection and monitoring instruments.....	50	(X)	a/ 518,929	(X)	a/ 517,284
3345195101	Radiation detecting elements, including ion chambers.....	15	b/ 73,137	a/ 66,370	b/r/ 76,763	r/ 72,751
3345195103	Solid state detectors 31/.....	6	c/ 11,534	b/ 29,273	(S)	(D)
3345195105	Nuclear monitoring instruments, including environmental, personal dosimetry, and medical monitors, both stationary and portable types.....	13	(S)	161,366	(S)	r/ 137,372
3345195107	Sample and flow counting systems, manual and automatic.....	5	(X)	a/ 8,775	(X)	a/r/ 13,327
3345195109	Scalers 32/.....	5	(S)	(D)	(S)	a/ 796
3345195114	Pulse analyzers, including single and multi-channel, and nuclear spectrometers 33/.....	5	(D)	(D)	(D)	(D)
3345195117	Count rate meters 33/.....	8	(D)	(D)	(D)	(D)
3345195119	Measurement and control devices using beta, gamma, or neutron gauge technology.....	8	(X)	a/ 35,588	(X)	a/ 78,269
3345195121	Nuclear power supplies 32/.....	5	(X)	19,594	(X)	17,948
3345195123	Neutron and photon activation analysis systems 33/.....	4	(X)	12,237	(X)	r/ 12,493
3345195125	Nuclear instrument modules, n.e.c.	10	(X)	c/ 53,076	(X)	r/ 40,200
3345195127	Other nuclear radiation detection and monitoring instruments 31/.....	13	(X)	b/ 83,312	(X)	95,989
3345195129	Parts and components for nuclear radiation detection and monitoring instruments, sold separately.....	15	(X)	b/ 49,338	(X)	b/ 48,139

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 2003 and 2002
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2003		2002	
			Quantity	Value	Quantity	Value
3345197	Commercial, geophysical, meteorological, and general-purpose instruments	148	(X) b/	1,329,686	(X)	1,383,821
3345197101	Barometers and barographs, aneroid and mercurial types, including recorders, wall, pendant, meteorological, hygrothermographs, barometer-thermometer-humidity combinations.....	8	(X)	958	(X) a/	842
3345197103	Hydrometers, glass, all types, including thermo-hydrometers 1/.....	5	(S) b/	777	(S) b/	1,320
3345197105	Liquid-in-glass thermometers: Engraved (etched) stem, thermoregulators, deep-sea reversing, laboratory, encased glass, ASTM standards, pocket case, max-min registering (except clinical thermometers).....	10	(X) c/	2,461	(X) c/	4,196
3345197107	Threaded and flanged types, fixed and adjustable angle, inline and duct installations, for process, food, air-conditioning, and refrigeration installations 1/.....	11	b/ 385 b/	6,394	b/ 377 b/	6,153
3345197109	Household and commercial thermometers such as wall, outdoor, domestic science, cupcase, filled systems, and indoor-outdoor 1/.....	9	1,821	4,103	1,783	3,384
3345197111	Bimetal thermometers: Threaded and flanged types, for pipeline and duct installations, including general and pocket test 1/.....	13	a/ 1,126	18,015	1,231	19,634
3345197113	Domestic science, commercial general test, indoor, outdoor, desk models, oven, refrigerator 1/.....	8	(S)	6,880	1,664	7,894
3345197115	Humidity indicating and recording instruments such as bi-hygroscopic and hygroscopic element, indicators, psychrometers, wet and dry bulb, hygrometers, indicating hygrometers.....	19	(X)	27,134	(X) r/	23,210
3345197117	Other thermometers (infrared, meteorological, commercial, and industrial).....	20	(X) b/	89,903	(X) a/	88,971
3345197123	Meteorological electronics equipment and radio astronomy equipment (automatic weather stations and weather tracking equipment, ceilometers, transimeters, space satellite meteorological systems, and specialized meteorological telemetering equipment).....	20	(X) a/	347,884	(X) r/	395,478
3345197125	Other meteorological instruments, including speed and direction instruments, rain gauges, thermographs, and parts, sold separately.....	17	(X) b/	40,473	(X) b/	38,494
3345197127	Seismic instruments.....	9	(X)	200,677	(X)	141,790
3345197129	All other geophysical instruments and equipment.....	24	(X)	144,101	(X)	140,468
3345197130	Commercial, geophysical, and meteorological laser systems and equipment.....	-	(X)	-	(X)	-
3345197131	Other commercial and industrial instruments (except aircraft), including compasses, altimeters, test equipment for hydraulic and pneumatic systems and controls, and environmental gas detectors, sold separately.....	40	(X)	408,488	(X) r/	472,932
3345197133	Parts and accessories for meteorological and commercial and industrial instruments.....	25	(X) a/	31,438	(X) a/	39,055
3345199	Surveying and drafting instruments and associated equipment.....	30	(X) c/	273,361	(X) r/	255,158
3345199101	Surveying instruments, including alidades, transits, plumb bobs, sextants, theodolites, surveyors, compasses, surveyors levels, tapes, etc.	18	(X) c/	193,779	(X) r/	190,669

Table 2. Quantity and Value of Shipments of Selected Instruments and Related Products: 2003 and 2002
 [Quantity in number of units. Value in thousands of dollars]

Product code	Product description	No. of cos.	2003		2002	
			Quantity	Value	Quantity	Value
3345199103	Parts and components for surveying instruments, sold separately.....	7	(X)	(D)	(X)	(D)
3345199105	Drafting instruments and machines, manual and automatic, drafting tables, plotting instruments, slide rules, T-squares, drafting templates, rules, etc.	10	(X)	c/ 34,861	(X)	a/ 34,320
3345199107	Parts and components for drafting instruments and machines, sold separately.....	2	(X)	(D)	(X)	(D)
3345199108	Surveying and drafting laser systems and equipment.....	1	(X)	(D)	(X)	(NA)
3345199109	Photogrammetric and geodetic equipment, excluding cameras.....	1	(X)	(D)	(X)	(D)
3345199111	Parts and components for photogrammetric and geodetic equipment, sold separately.....	1	(X)	(D)	(X)	(D)

- Represents zero. D Withheld to avoid disclosing data for individual companies. NA Not available. n.e.c. Not specified by kind. r/Revised by 5 percent or more from previously published data. S Does not meet publication standards. X Not applicable.

- 1/The quantity for this product code is in thousands of units.
- 2/Product code 332911F122 is combined with product code 332911F125 to avoid disclosing data for individual companies.
- 3/Product code 332911H105 is combined with product code 332911H107 to avoid disclosing data for individual companies.
- 4/Product code 3345111109 is combined with product code 3345111111 to avoid disclosing data for individual companies.
- 5/Product codes 3345111217, 3345111219, 3345111221, and 3345111223 are combined with product code 3345111225 to avoid disclosing data for individual companies.
- 6/Product code 3345113209 is combined with product code 3345113211 to avoid disclosing data for individual companies.
- 7/Product codes 3345113313, 3345113315, and 3345113425 are combined with product code 3345113429 to avoid disclosing data for individual companies.
- 8/Product codes 3345113655, 3345113657, 3345113659, and 3345113665 are combined with product code 3345113667 to avoid disclosing data for individual companies.
- 9/Product code 3391110121 is combined with product code 3391110233 to avoid disclosing data for individual companies.
- 10/Product codes 3345120107, 3345120109, and 3345120222 are combined with product code 3345120111 to avoid disclosing data for individual companies.
- 11/Product code 3345120115 is combined with product code 3345120117 to avoid disclosing data for individual companies.
- 12/For 2003, product codes 3345130116 and 3345130119 are combined with product code 3345130113 to avoid disclosing data for individual companies.
- 13/For 2002, product codes 3345130116, 3345130119, and 3345130121 are combined with product code 3345130113 to avoid disclosing data for individual companies.
- 14/Product code 3345130225 is combined with product code 3345130227 to avoid disclosing data for individual companies.
- 15/Product code 3345130239 is combined with product code 3345130237 to avoid disclosing data for individual companies.
- 16/Product code 3345130255 is combined with product code 3345130253 to avoid disclosing data for individual companies.
- 17/Product code 3345130263 is combined with product code 3345130261 to avoid disclosing data for individual companies.
- 18/Product code 3345130271 is combined with product code 3345130269 to avoid disclosing data for individual companies.
- 19/Product codes 3345141101 and 3345141103 are combined with product code 3345141107 to avoid disclosing data for individual companies.
- 20/Product code 3345141115 is combined with product code 3345141117 to avoid disclosing data for individual companies.
- 21/Product code 3345145105 is combined with product code 3345145107 to avoid disclosing data for individual companies.
- 22/Product codes 3345153105 and 3345153109 are combined with product code 3345153107 to avoid disclosing data for individual companies.
- 23/Product codes 3345153115 and 3345153151 are combined with product code 3345153195 to avoid disclosing data for individual companies.
- 24/For 2003, product code 3345153139 is combined with product code 3345153143 to avoid disclosing data for individual companies.
- 25/Product code 3345153155 is combined with product code 3345153159 to avoid disclosing data for individual companies.
- 26/Product code 3345155116 is combined with product code 3345155119 to avoid disclosing data for individual companies.
- 27/For 2003, product codes 3345160137 and 3345160139 are combined with product code 3345160141 to avoid disclosing data for individual companies.
- 28/For 2002, product codes 3345160137, 3345160139, 3345160141, 3345160153, 3345160161, and 3345160164 are combined with product code 3345160165 to avoid disclosing data for individual companies.
- 29/For 2002, product code 3333141104 is combined with product code 3333141105 to avoid disclosing data for individual companies.
- 30/Product codes 3345192103 and 3345192109 are combined with product code 3345192115 to avoid disclosing data for individual companies.
- 31/For 2002 product code 3345195103 is combined with product code 3345195127 to avoid disclosing data for individual companies.
- 32/For 2003 product code 3345195109 is combined with product code 3345195121 to avoid disclosing data for individual companies.
- 33/Product codes 3345195114 and 3345195117 are combined with product code 3345195123 to avoid disclosing data for individual companies.

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

Table 3. Shipments, Exports and Imports of Selected Instruments and Related Products: 2003
 [Value in thousands of dollars]

Product code	Product description	Manufacturers' shipments (value of f.o.b. plant)	Exports of domestic merchandise (value at port) 1/	Imports for consumption (value) 2/3/
332911F101, 103, 105, 107, 109, 111, 113	Pneumatic actuated automatic valves.....	575,999	76,602	35,748
332911F115, 117, 122, 125, 127, 129	All other control valves including electric and electrohydraulic.....	396,892	554,945	617,961
332911F131, 133, 135, 137, 139, 141	Self-generating power actuated regulator valves.....	909,402	155,280	511,253
332911H101, 103, 105, 107, 109	Solenoid-operated valves (except nuclear and fluid transfer).....	468,251	132,869	675,917
3345111101	Compasses (magnetic and gyroscopic).....	316,532	84,943	97,430
3345111103, 105, 107, 109, 111, 113, 115, 217, 219, 221, 223, 225, 227, 229, 231, 233, 335, 437 3345113101, 103, 105	Search, detection, aeronautical, nautical, and navigational and guidance systems, equipment, and instruments, n.e.c. (except aircraft engine instruments) 4/.....	5,912,232	870,098	432,239
3345113207, 209, 211, 313, 315, 317, 319, 321, 323	Radar systems and equipment 5/.....	5,093,156	624,764	107,040
3345113651	Radio navigational aid receivers and displays.....	602,683	309,068	736,744
3345113665	Automatic pilots.....	(D)	209,933	56,779
3345113425, 427, 429, 431, 433, 435, 437, 439, 441, 443, 545, 547, 549, 653, 655, 657, 659, 661, 663, 667, 669, 671 673	Sonar search, detection, tracing, and communication systems and equipment, including ASW (sonar telephone, communication equipment, depth finding, fire control, fusing guidance, hydrophones, mapping, sonabuys, navigation, sonar fish finders, sonar finders, sonar range instrumentation, and other).....	16,648,417	117,360	148,665
3345120102, 225	Temperature responsive automatic controls (thermostats).....	633,586	129,580	402,259
3345120105, 107, 109, 111, 113, 115, 117, 219, 222, 223, 227	Pressure responsive automatic, hydraulic automatic, pneumatic automatic, and automatic control, n.e.c.	1,265,589	1,190,826	1,425,132
3345120229	Parts and components for automatic controls, sold separately.....	72,426	487,334	539,199
3345130	Process control instruments.....	5,813,748	880,757	890,864
3345141101, 103, 105, 107	Gas meters, consumption registering (except parts).....	221,240	26,269	16,111
3345141109, 111, 113, 115, 117	Liquid meters (except parts).....	710,604	75,999	18,610
3345141119	Parts, components, and accessories for gas and liquid meters, sold separately.....	392,255	54,773	115,490
3345143101, 103, 105, 107 3345145, 3345192, 3345155	Counting devices, n.e.c., including taxi meters and parts, parking meters and parts, aircraft engine and motor vehicle instruments.....	4,129,941	468,756	1,154,936
3345151	Electricity meters.....	630,872	73,836	85,410
3345153101, 103, 105	Voltage, current, and resistance measuring equipment (except multimeters) 6/.....	108,204	210,837	115,437
3345153114, 115	Power and energy testing equipment.....	(D)	224,048	80,780

Continued

Table 3. Shipments, Exports and Imports of Selected Instruments and Related Products: 2003
 [Value in thousands of dollars]

Product code	Product description	Manufacturers' shipments (value of f.o.b. plant)	Exports of domestic merchandise (value at port) 1/	Imports for consumption (value) 2/3/
3345153171, 173	Analyzers for testing characteristics of internal-combustion engines (except aircraft).....	(D)	215,383	123,239
3345153131, 133, 135	Signal generating equipment.....	134,499	85,982	40,611
3345153107, 109, 118, 126, 137, 139, 143, 149, 151, 153, 155, 157, 159, 161, 163, 165, 168, 175, 177, 179, 181, 183, 185, 187, 189, 193	Test equipment for testing multimeters, electrical, radio and communication circuits, and motors, n.e.c.	6,712,233	2,138,556	593,950
3391110, 3345160	Laboratory, analytical, and scientific instruments	9,957,684	2,052,241	1,444,089
3333141	Sighting, tracking, and fire control equipment, optical type.....	622,113	38,791	107,548
3333143111, 113, 115	Binoculars and astronomical instruments and parts and accessories.....	104,465	134,511	315,749
3333143231, 235, 237, 242, 243, 245, 247, 249	Optical instruments and lenses, n.e.c.	2,010,016	1,367,039	214,004
3333143233	Microscopes, optical.....	30,224	43,454	232,157
3345194	Physical properties testing and inspection equipment and kinematic testing and measuring equipment.....	1,775,215	547,841	98,095
3345195	Nuclear radiation detection and monitoring instruments and equipment.....	518,929	265,643	108,494
3345197105, 107, 109	Liquid-in-glass thermometers, n.e.c.	12,958	9,902	17,902
3345197111, 113, 117	Thermometers (except liquid-in-glass type).....	114,798	22,227	228,691
3345197129	Geophysical instruments and equipment.....	144,101	218,262	113,949
3345197127	Seismic instruments.....	200,677	11,595	13,615
3345197101, 115, 123, 125	Commercial, geophysical, meteorological, and general-purpose instruments, n.e.c.	416,449	197,314	273,014
3345199101, 103	Surveying instruments (except photogrammetrical and geodetic equipment).....	(D)	50,326	173,163
3345199105	Drafting instruments and machines, manual and automatic.....	34,861	31,609	42,635

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

4/Product code 3345113105 is excluded from "Manufacturers' shipments" to avoid disclosing data for individual companies.

5/Product codes 3345113313 and 3345113315 are excluded from "Manufacturers' shipments" to avoid disclosing data for individual companies.

6/Product code 3345153105 is excluded from "Manufacturers' shipments" to avoid disclosing data for individual companies.

Table 4. Comparison of North American Industry Classification-Based Product Codes with Schedule B Export Codes, and HTSUSA Import Codes: 2003

Product code	Product description	Export code 1/	Import code 2/
332911F101, 103, 105, 107, 109, 111, 113	Pneumatic actuated automatic valves.....	8481.80.9035	8481.80.9035
332911F115, 117, 122, 125, 127, 129	All other control valves, including electric and electrohydraulic.....	8481.80.9020 8481.80.9030 8481.80.9045 8481.80.9050	8481.80.9020 8481.80.9030 8481.80.9045 8481.80.9050
332911F131, 133, 135, 137, 139, 141	Self-generating power actuated regulator valves.....	8481.80.9015	8481.80.9015
332911H101, 103, 105, 107, 109	Solenoid-operated valves (except nuclear and fluid transfer).....	8481.80.9005	8481.80.9005
3345111101	Compasses (magnetic and gyroscopic).....	9014.10.1040 9014.10.1080 9014.10.6040 9014.10.6080 9014.10.7040 9014.10.7080 9014.10.9040 9014.10.9080	9014.10.1000 9014.10.6000 9014.10.7030 9014.10.7060 9014.10.9000
3345111103, 105, 107, 109, 111, 113, 115, 217, 219, 221, 223, 225, 227, 229, 231, 233, 335, 437 3345113101, 103, 105	Search, detection, aeronautical, nautical, and navigational and guidance systems, equipment, and instruments, n.e.c. (except aircraft engine instruments).....	9014.20.2000 9014.20.6000 9014.20.8040 9014.20.8080 9014.90.0000	9014.20.2000 9014.20.6000 9014.20.8040 9014.20.8080 9014.90.2040 9014.90.2080 9014.90.6000 9014.80.1000
3345113207, 209, 211, 313, 315, 317, 319, 321, 323	Radar systems and equipment.....	8526.10.0010 8526.10.0020 8526.10.0070	8526.10.0020 8526.10.0040
3345113651	Radio navigational aid receivers and displays.....	8526.91.0010 8526.91.0030 8526.91.0070	8526.91.0020 8526.91.0040
3345113665	Automatic pilots.....	9014.20.4000 9014.90.0000	9014.20.4000 9014.90.1000
3345113425, 427, 429, 431, 433, 435, 437, 439, 441, 443, 545, 547, 549, 653, 655, 657, 659, 661, 663, 667, 669, 671 673	Sonar search, detection, tracing, and communication systems and equipment, including ASW (sonar telephone, communication equipment, depth finding, fire control, fusing guidance, hydrophones, mapping, sonabuoys, navigation, sonar fish finders, sonar range instrumentation, and other).....	9014.80.2000 9014.80.6000	9014.80.2000 9014.80.4000 9014.80.5000

Continued

Table 4. Comparison of North American Industry Classification-Based Product Codes with Schedule B Export Codes, and HTSUSA Import Codes: 2003

Product code	Product description	Export code 1/	Import code 2/
3345120102, 225	Temperature responsive automatic controls (thermostats).....	9032.10.0000	9032.10.0030 9032.10.0060 9032.10.0090
3345120105, 107, 109, 111, 113, 115, 117, 219, 222, 223, 227	Pressure responsive automatic, hydraulic automatic, pneumatic automatic, and automatic controls, n.e.c.	9032.20.0000 9032.81.0080 9032.89.6020 9032.89.6085	9032.20.0000 9032.81.0080 9032.89.6015 9032.89.6025 9032.89.6085
3345120229	Parts and components for automatic controls, sold separately.....	9032.90.0000	9032.90.2000 9032.90.4000 9032.90.6020 9032.90.6040 9032.90.6060 9032.90.6080
3345130	Process control instruments.....	9032.81.0040 9032.81.0080 9032.89.6030 9032.89.6040 9032.89.6050 9032.89.6060 9032.89.6070 9032.89.6075	9032.81.0020 9032.81.0060 9032.89.6030 9032.89.6040 9032.89.6050 9032.89.6060 9032.89.6070 9032.89.6075
3345141101, 103, 105, 107	Gas meters, consumption registering (except parts)	9028.10.0000	9028.10.0000
3345141109, 111, 113, 115, 117	Liquid meters (except parts).....	9028.20.0000	9028.20.0000
3345141119	Parts, components, and accessories for gas and liquid meters, sold separately.....	9028.90.0080	9028.90.0080
3345143101, 103, 105, 107 3345145, 3345192, 3345155	Counting devices, n.e.c., including taxi meters and parts, parking meters and parts, and motor vehicle instruments.....	9106.20.0000 9028.90.0040 9029.10.0000 9029.20.4040 9029.20.5000 9029.90.0000	9106.20.0000 9029.10.4000 9028.90.0040 9029.10.8000 9029.20.4040 9029.20.4080 9029.90.2000 9029.90.8040 9029.90.8080
3345151	Electricity meters.....	9028.30.0000	9028.30.0000

Continued

Table 4. Comparison of North American Industry Classification-Based Product Codes with Schedule B Export Codes, and HTSUSA Import Codes: 2003

Product code	Product description	Export code 1/	Import code 2/
3345153101, 103, 105	Voltage, current, and resistance measuring equipment (except multimeters).....	9030.39.0040	9030.39.0040
3345153114, 115	Power and energy testing equipment.....	9030.39.0080	9030.39.0080
3345153171, 173	Analyzers for testing characteristics of internal-combustion engines (except aircraft).....	9031.80.8060 9031.80.8070	9031.80.8060 9031.80.8070
3345153131, 133, 135	Signal generating equipment.....	8543.20.0000	8543.20.0000
3345153107, 109, 118, 126, 137, 139, 143, 149, 151, 153, 155, 157, 159, 161, 163, 165, 168, 175, 177, 179, 181, 183, 185, 187, 189, 193	Test equipment for testing multimeters, electrical, radio and communication circuits, and motors, n.e.c.	9029.20.6000 9030.31.0000 9030.82.0000 9030.20.0000 9030.90.8010 9030.90.8020 9030.90.8030 9030.90.8040 9030.90.8050 9030.90.8060	9029.20.6000 9030.31.0000 9030.82.0000 9030.90.4500 9030.90.8400 9030.90.8810 9030.90.8820 9030.90.8830 9030.90.8840 9030.90.8855 9030.90.8860
3391110, 3345160	Laboratory, analytical, and scientific instruments.....	9027.50.5000 9027.50.2000 9027.20.2000 9027.20.6050 9027.20.5030 9027.20.9000 9027.30.4040 9027.30.4080 9027.80.2000 9027.80.3100 9027.80.3200 9027.80.3500 9027.80.8000 9027.90.2000 9012.10.0000	9027.20.5030 9027.20.5050 9027.20.5060 9027.20.5080 9027.20.8030 9027.20.8060 9027.20.8090 9027.30.4040 9027.30.4080 9027.50.4015 9027.50.4020 9027.80.4520 9027.80.4530 9027.80.4560 9027.80.4590 9027.90.8400 9027.90.8800 9012.10.0000 9027.80.8030 9027.80.8060 9027.80.8090
3333141	Sighting, tracking, and fire control equipment, optical type.....	9013.10.2000 9013.10.4000	9013.10.1000 9013.10.3000 9013.10.4000

Continued

Table 4. Comparison of North American Industry Classification-Based Product Codes with Schedule B Export Codes, and HTSUSA Import Codes: 2003

Product code	Product description	Export code 1/	Import code 2/
3333143111, 113, 115	Binoculars and astronomical instruments and parts and accessories.....	9005.10.0020	9005.10.0020
		9005.10.0040	9005.10.0040
		9005.10.0080	9005.10.0080
		9005.80.4020	9005.80.4020
		9005.80.4040	9005.80.4040
		9005.80.6000	9005.80.6000
		9005.90.0000	9005.90.4000 9005.90.8000
3333143231, 235, 237, 242, 243, 245, 247, 249	Optical instruments and lenses, n.e.c.	9031.41.0000	9031.41.0020
		9031.90.0000	9031.41.0040 9031.41.0060 9031.90.4500 9031.90.5400 9031.90.5800
3333143233	Microscopes, optical.....	9011.10.0000	9011.10.4000
		9011.20.0000	9011.10.8000
		9011.80.0000	9011.20.4000
		9011.90.0000	9011.20.8000 9011.80.0000 9011.90.0000
3345194	Physical properties testing and inspection equipment and kinematic testing and measuring equipment.....	9024.10.0000	9024.10.0000
		9024.80.0000	9024.80.0000
		9024.90.0000	9024.90.0040 9024.90.0080
3345195	Nuclear radiation detection and monitoring instruments and equipment.....	9030.10.0000	9030.10.0000
		9030.90.4000	
3345197105, 107, 109	Liquid-in-glass thermometers, n.e.c.	9025.11.4000	9025.11.4000
3345197111, 113, 117	Thermometers (except liquid-in-glass type).....	9025.19.4000	9025.19.8040
		9025.19.8040	9025.19.8080
3345197129	Geophysical instruments and equipment.....	9015.80.8040	9015.80.8040
3345197127	Seismic instruments.....	9015.80.6000	9015.80.6000
3345197101, 115, 123, 125	Commercial, geophysical, meteorological, and general purpose instruments, n.e.c.	9025.80.1500	9025.80.1500
		9025.80.5050	9025.20.8000
		9015.80.8080	9025.80.1000
		9025.90.0000	9025.80.2000 9025.80.3500 9025.80.4000 9025.80.5000 9025.90.0000 9015.80.8080

Table 4. Comparison of North American Industry Classification-Based Product Codes with Schedule B Export Codes, and HTSUSA Import Codes: 2003

Product code	Product description	Export code 1/	Import code 2/
3345199101, 103	Surveying instruments (except photogrammetrical and geodetic equipment).....	9015.10.0000	9015.10.4000
		9015.20.0000	9015.10.8000
		9015.30.0000	9015.20.4000
			9015.20.8000
			9015.30.4000
			9015.30.8000
			9015.90.0010
	9015.90.0020		
	9015.90.0030		
3345199105	Drafting instruments and machines, manual and automatic.....	9017.10.0000	9017.10.4000
		9017.20.4000	9017.10.8000
		9017.20.8060	9017.20.4000
			9017.20.7000
			9017.20.8080

n.e.c. Not elsewhere classified.

1/Source: 2003 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 (2003).

Appendix.

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

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.)

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.

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 instruments and related products have been collected by the Census Bureau since 1961. Historical data may be obtained from Current Industrial Reports available at your local Federal Depository Library.