

*(Formerly Series No. MA28C)*

Information about the scope of the survey, methodology, explanation of terms and historical notes for this survey may be found in the introduction of the 1997 Manufacturing Profiles, issued August 1999.

Current data are released electronically on Internet for all individual surveys as they become available. Use: <http://www.census.gov/econ/www/manumenu.html>. Individual reports can be accessed by choosing "Current Industrial Reports (CIR's)," clicking on "Report Number Index;" from the "Industrial Products by Numeric Index," choose the survey of interest. Follow the menu to view the PDF file or to download the worksheet file (WK format) to your personal computer.

These data are also available through the U.S. Department of Commerce and STAT-USA Electronic Bulletin Board by subscription. To access, dial 202-482-3870 and follow the prompts to register. Also, you may call 202-482-1986 or 1-800-STAT-USA, for further information. The Internet address is: [www.stat-usa.gov/](http://www.stat-usa.gov/).

NOTE: Data are now published on the new North American Industry Classification System (NAICS) basis and therefore are not always comparable to the old Standard Industrial Classification (SIC) code. For further information on NAICS, see [www.census.gov/epcd/www/naics.html](http://www.census.gov/epcd/www/naics.html).

**Summary of Findings:** In 1998, total manufacturers' shipments of industrial gases amounted to \$4,187.9 million, an increase of 10.7 percent from the 1997 shipments of \$3,780.7 million.

Total shipments of carbon dioxide increased 19.9 percent to \$460.4 million in 1998, from \$383.9 million in 1997. Carbon dioxide gas shipments increased 9.3 percent to \$56.1 million in 1998,

from \$51.3 million in 1997. Carbon dioxide liquid shipments increased 26.3 percent of \$372.1 million in 1998 from \$294.5 million in 1997; however, solid carbon dioxide (dry ice) shipments decreased 15.4 percent in 1998, with a value of \$32.2 million, from a 1997 value of \$38.1 million.

Total production of nitrogen increased 7.7 percent in 1998 to 870.9 billion cubic feet, from 808.2 billion in 1997. Shipments of nitrogen increased 14.3 percent to \$1,255.4 million in 1998, from \$1,098.4 million in 1997. Production of nitrogen gas increased 7.8 percent in 1998 to 565.4 billion cubic feet, from 524.4 billion in 1997, and shipments of nitrogen gas increased 10.1 percent to \$434.9 million, from \$394.8 million in 1997. Production of liquid nitrogen for merchant shipments increased 4.5 percent in 1998 to 250.1 billion cubic feet, from 239.2 billion in 1997.

Total production of oxygen decreased 9.0 percent to 676.3 billion cubic feet in 1998, from 743.0 billion in 1997; however, shipments of oxygen increased 3.1 percent to \$1,026.9 million in 1998, from \$995.6 million in 1997. Production of oxygen gas decreased 12.0 percent in 1998 to 515.5 billion cubic feet, from 586.3 billion in 1997; shipments of oxygen gas increased 3.3 percent to \$575.7 million in 1998, from \$557.3 in 1997. Production of liquid oxygen for merchant shipments increased 3.0 percent in 1998 to 113.6 billion cubic feet from 110.3 billion in 1997; however, shipments decreased 5.8 percent to \$363.1 million in 1998, from \$385.4 million in 1997.

Total production of hydrogen increased 5.0 percent to 551.9 billion cubic feet in 1998, from 525.8 billion in 1997.

## Current Industrial Reports

Address inquiries concerning these data to Primary Goods Industries Branch, Manufacturing and Construction Division (MCD), Washington, DC 20233-6900, or call Suzanne Conard, 301-457-4791.

For mail or fax copies of this publication, please contact the Information Services Center, MCD, Washington, DC 20233-6900, or call 301-457-4673.



Table 1. Production and Shipments of Selected Industrial Gases: 1995 to 1998  
 [Value in millions of dollars]

Product code	Product description	Year	Unit of measure	Shipments		
				Production	Quantity	Value
3251201	Acetylene.....	1998.....	Bil cu ft.....	4.6	2.9	151.1
		1997.....	.....do.....	r/ 4.9	r/ 2.7	143.5
		1996.....	.....do.....	5.5	3.3	158.7
		1995.....	.....do.....	5.9	3.4	155.0
3251204	Carbon dioxide: Gas.....	1998.....	1,000 s tons...	5,649.3	4,870.6	56.1
		1997.....	.....do.....	5,527.4	4,462.7	51.3
		1996.....	.....do.....	4,899.7	4,462.9	51.3
		1995.....	.....do.....	5,633.2	5,282.4	59.9
	Liquid.....	1998.....	.....do.....	8,147.6	8,412.4	372.1
		1997.....	.....do.....	6,585.8	6,419.1	294.5
		1996.....	.....do.....	6,661.6	6,528.6	313.9
		1995.....	.....do.....	6,409.6	6,057.2	369.0
	Solid (dry ice).....	1998.....	.....do.....	283.7	287.3	32.2
		1997.....	.....do.....	385.6	386.4	38.1
		1996.....	.....do.....	320.0	300.2	33.4
		1995.....	.....do.....	300.4	297.9	35.1
3251207	Nitrogen.....	1998.....	Bil cu ft.....	870.9	850.2	1,255.4
		1997.....	.....do.....	808.2	790.3	1,098.4
		1996.....	.....do.....	823.5	792.9	1,123.9
		1995.....	.....do.....	808.9	806.1	1,139.4
325120A	Oxygen.....	1998.....	.....do.....	676.3	653.4	1,026.9
		1997.....	.....do.....	743.0	689.6	995.6
		1996.....	.....do.....	682.2	649.1	947.9
		1995.....	.....do.....	629.8	597.7	968.5
325120D pt.	Hydrogen.....	1998.....	.....do.....	551.9	283.1	512.7
		1997.....	.....do.....	r/ 525.8	r/ 249.8	r/ 465.5
		1996.....	.....do.....	385.7	165.9	365.3
		1995.....	.....do.....	351.7	138.4	310.8

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

Table 2. Quantity of Primary Production of Specified Industrial Gases: 1998 and 1997  
 [Production and quantity of shipments in million cubic feet, unless otherwise noted. Value in thousands of dollars]

Product code	Production description	1998			1997		
		Production	Quantity	Value	Production	Quantity	Value
325120	Industrial gases.....	(X)	(X)	4,187,996	(X)	(X)	3,780,655
3251201011	Acetylene 1/.....	4,649	2,922	151,052 r/	4,948 r/	2,725	143,477
3251201021	Produced for compression, including cylinder and pipeline.....	666	628	75,319 r/	674 r/	648	68,189
3251204011	Produced for pipeline shipment, excluding that shipped to be compressed, and for consumption in same plant .....	3,983	2,294	75,733	4,274 r/	2,077	75,288
3251204011	Carbon dioxide (short tons) 2/.....	14,080,559	13,570,266	460,410	12,498,705	11,268,219	383,896
3251204021	Gas, including amounts produced and liquefied (short tons) .....	5,649,290	4,870,550	56,102 r/	5,527,377	4,462,728	51,293
3251204031	Liquid, including amounts produced and used to make dry ice (short tons).....	8,147,567	8,412,440	372,062	6,585,772	6,419,080	294,533
3251204031	Solid, (dry ice) (short tons) .....	283,702	287,276	32,246	385,556	386,411	38,070
3251207011	Nitrogen 3/.....	870,906	850,154	1,255,401	808,183	790,302	1,098,411
3251207021	Gas produced by: Cryogenic onsite and pipeline 4/.....	(D)	(D)	(D)	(D)	(D)	(D)
3251207031	Noncryogenic processes (psa, vpsa, membranes, etc.) 4/.....	565,144	570,811	434,984	524,399	526,440	394,801
3251207041	Captive uses for consumption in same plant: Cryogenic processes 5/.....	(D)	(X)	(X)	(D)	(X)	(X)
3251207051	Noncryogenic processes (psa, vpsa, membranes, etc.) 5/.....	(D)	(X)	(X)	(D)	(X)	(X)
3251207061	Liquid produced for: Merchant shipment .....	250,062	243,637	732,411	239,154	243,915	639,064
3251207071	Consumption in same plant 5/.....	19,819	(X)	(X) r/	22,518	(X)	(X)
3251207071	Supplemental shipments or uses ....	35,881	35,706	88,006	22,112	19,947	64,546
325120A011	Oxygen .....	676,332	653,415	1,026,928	743,023	689,590	995,585
325120A021	Gas produced by: Cryogenic onsite and pipeline 6/.....	(D)	(D)	(D)	(D)	(D)	(D)
325120A031	Noncryogenic processes (psa, vpsa, membranes, etc.) 6/ .....	515,508	516,603	575,761	586,298	562,759	557,328
325120A041	Captive uses for consumption in same plant: Cryogenic processes 7/.....	(D)	(X)	(X)	(D)	(X)	(X)
325120A051	Noncryogenic processes (psa, vpsa, membranes, etc.) 7/.....	(D)	(D)	(D)	(D)	(D)	(D)
325120A061	Liquid produced for: Merchant shipment .....	113,626	113,245	363,121	110,260	110,736	385,446
325120A071	Consumption in same plant 7/.....	23,232	(X)	(X)	29,747	(X)	(X)
325120D011	Supplemental shipments or uses ....	23,966	23,567	88,046	16,718	16,095	52,811
325120D021	Elemental gases and other industrial gases, n.e.c. ....	(X)	(X)	1,067,127	(X)	(X)	971,294
325120D031	Argon .....	(D)	(D)	(D)	(D)	(D)	(D)
325120D041	Argon, crude .....	(D)	(D)	(D)	(D)	(D)	(D)
325120D051	Argon, high purity, produced for cylinder and bulk delivery, and pipeline shipments, and for consumption in same plant .....	19,442	18,749	327,361	17,243	16,817	317,759
325120D061	Helium 8/ .....	(X)	4,023	(X)	(X) r/	3,414	(X)
325120D071	Hydrogen 9/.....	551,914	283,089	512,688 r/	525,833 r/	249,800 r/	465,543
325120D081	Gas produced for: Merchant shipment 10/.....	(D)	(D)	(D)	(D)	(D)	(D)
325120D091	Pipeline and on-site use 10/.....	(D)	(D)	(D)	(D)	(D)	(D)
325120D101	Consumption in same plant .....	260,611	(X)	(X)	250,150	(X)	(X)
325120D111	Liquid produced for: Merchant shipment 10/.....	(D)	(D)	(D)	(D)	(D)	(D)
325120D121	Supplemental shipments or uses 10/.....	291,303	283,089	512,688 r/	275,683 r/	249,800 r/	465,543
325120D131	Other elemental gases .....	(X)	(X)	(D)	(X)	(X)	(D)
325120D141	Nitrous oxide 11/ .....	(D)	(D)	(D)	(D)	(D)	(D)

Continued

Table 2. Quantity of Primary Production of Specified Industrial Gases: 1998 and 1997  
 [Production and quantity of shipments in million cubic feet, unless otherwise noted. Value in thousands of dollars]

Product code	Production description	1998			1997		
		Shipments			Shipments		
		Production	Quantity	Value	Production	Quantity	Value
325120D095	Other compressed and liquefied gases 11/ 12/.....	(X)	(X)	174,247	(X)	(X) r/	140,089
325120W	Industrial gases, n.s.k. ....	(X)	(X)	52,831	(X)	(X)	47,903

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

- 1/Excludes information from railroad ships, shipyards, welding shops, and small establishments using portable generators.
- 2/Excludes quantities produced and consumed in plants manufacturing soda ash or urea. "Carbon dioxide gas" data should be used with caution since it includes data for gas produced in the production of petroleum, whose data is difficult to measure.
- 3/Excludes amounts produced and consumed in the manufacturing of synthetic ammonia or ammonia derivatives.
- 4/Product code 3251207011 has been combined with product code 3251207021 to avoid disclosing data for individual companies.
- 5/Product code 3251207031 and 3251207041 are combined with product code 3251207061 to avoid disclosing data for individual companies.
- 6/Product code 325120A011 has been combined with product code 325120A021 to avoid disclosing data for individual companies.
- 7/Product code 325120A031 and 325120A041 are combined with product code 325120A061 to avoid disclosing data for individual companies.
- 8/Source: U. S. Geological Surveys.
- 9/Excludes amounts vented, used as fuel, etc., and amounts produced and consumed in the manufacturing of synthetic ammonia and methanol, but includes an unspecified amount produced for sale or interplant transfer to plants consuming this gas in production of ammonia. Also excludes amount produced by ammonia dissociation process (cracking of ammonia). Also excludes amounts produced in petroleum refineries for captive use.
- 10/Product codes 325120D031, 325120D041, 325120D061 and 325120D071 are combined to avoid disclosing data for individual companies.
- 11/Product code 325120D081 and 325120D095 are combined to avoid disclosing data for individual companies.
- 12/Excludes hydrocarbon gases such as propane, butane, and propylene, or halogenated hydrocarbons and cyclopropane. Also excludes sulfur dioxide and chlorine data, which are shown in Current Industrial Reports Series, MA325A(98)-1 Inorganic Chemicals.

Note: N. s. k. represents the value of shipments for establishments that did not provide detailed information by type of product. N.s.k. value has been estimated based on rate of change for reporting establishments applied to previous year's

**Table 3. Production and Shipments of Acetylene by Geographic Area: 1998 and 1997**  
 [Production and quantity of shipments in million cubic feet. Value in thousands of dollars]

Geographic area	1998			1997		
	Production	Quantity	Value	Production	Quantity	Value
<b>Total.....</b>	<b>4,649</b>	<b>2,922</b>	<b>151,052</b>	r/ <b>4,948</b>	r/ <b>2,725</b>	<b>143,477</b>
Northeast Region.....	84	79	8,420	r/ 102	r/ 101	r/ 9,614
North Central Region.....	201	180	17,658	193	r/ 184	18,064
East North Central.....	124	117	12,468	129		12,913
West North Central.....	77	63	5,190	64	r/ 62	5,151
South Region.....	4,251	2,549	111,464	r/ 4,527	r/ 2,315	101,934
South Atlantic and East						
South Central.....	664	648	44,999	742	723	47,056
West South Central.....	3,587	1,901	66,465	r/ 3,785	r/ 1,592	r/ 54,878
West Region.....	113	114	13,510	r/ 126	r/ 125	r/ 13,865
Mountain.....	15	15	1,739	26	25	2,957
Pacific.....	98	99	11,771	100	100	10,908

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

See note at end of Table 6 for explanation of geographic areas.

Table 4. Production and Shipments of Carbon Dioxide by Geographic Area: 1998 and 1997  
 [Production and quantity in short tons. Value in thousands of dollars]

Geographic area	Liquid			Solid		
	Production	Quantity	Value	Production	Quantity	Value
1998						
Total.....	8,147,567	8,412,440	372,062	283,702	287,276	32,246
Northeast Region 1/.....	(D)	(D)	(D)	(D)	(D)	(D)
North Central Region.....	1,558,190	1,555,817	83,276	121,981	121,247	11,792
East North Central 1/.....	966,690	976,193	54,427	40,485	40,977	4,317
West North Central.....	591,500	579,624	28,849	81,496	80,270	7,475
South Region.....	5,317,920	5,601,926	219,018	108,623	109,551	12,936
South Atlantic and East						
South Central.....	1,860,388	2,005,845	104,106	59,123	59,019	6,729
West South Central.....	3,457,532	3,596,081	114,912	49,500	50,532	6,207
West Region.....	1,271,457	1,254,697	69,768	53,098	56,478	7,518
Mountain.....	368,527	343,753	21,680	20,339	21,417	1,552
Pacific.....	902,930	910,944	48,088	32,759	35,061	5,966
1997						
Total.....	6,585,772	6,419,080	294,533	385,556	386,411	38,070
Northeast Region 1/.....	(D)	(D)	(D)	(D)	(D)	(D)
North Central Region.....	r/ 1,708,506	r/ 1,635,526	r/ 70,918	180,132	179,951	15,979
East North Central 1/.....	r/ 1,073,900	r/ 1,053,076	r/ 50,407	r/ 74,718	r/ 75,912	r/ 6,616
West North Central.....	r/ 634,606	r/ 582,450	r/ 20,511	r/ 105,414	r/ 104,039	r/ 9,363
South Region.....	3,761,161	3,692,111	172,219	106,975	106,469	12,397
South Atlantic and East						
South Central.....	2,135,561	2,168,129	90,910	53,727	53,241	r/ 5,696
West South Central.....	r/ 1,625,600	1,523,982	81,309	53,248	53,228	6,701
West Region.....	1,116,105	1,091,443	51,396	98,449	99,991	9,694
Mountain.....	(D)	(D)	(D)	20,631	21,222	1,602
Pacific.....	(D)	(D)	(D)	77,818	78,769	8,092

D Withheld to avoid disclosing data for individual companies. r/Revised by 5 percent or more from previously published data.

1/Totals for Northeast Region are combined with East North Central to avoid disclosing data for individual companies.

See note at end of Table 6 for explanation of geographic areas.

Table 5. Production and Shipments of Argon and Hydrogen by Geographic Area: 1998 and 1997  
 [Production and quantity in million cubic feet. Value in thousands of dollars]

Argon						
Geographic area	1998			1997		
	Shipments			Shipments		
	Production	Quantity	Value	Production	Quantity	Value
<b>Total .....</b>	<b>(D)</b>	<b>(D)</b>	<b>(D)</b>	<b>(D)</b>	<b>(D)</b>	<b>(D)</b>
Northeast Region .....	1,959	1,960	37,272	1,726	1,759	31,769
North Central Region	(D)	(D)	(D)	(D)	(D)	(D)
East North Central .....	6,816	6,845	111,322	6,434	6,429	113,304
West North Central .....	(D)	(D)	(D)	(D)	(D)	(D)
South Region .....	9,945	9,250	165,450	9,338	8,899	153,020
South Atlantic .....	1,971	1,962	40,684	1,695	1,701	33,594
East South Central .....	1,999	1,844	35,530	1,324	1,325	26,926
West South Central .....	5,975	5,444	89,236	6,319	5,873	92,500
West Region.....	1,865	1,849	36,776	1,696	1,719	32,340

  

Hydrogen						
Geographic area	1998			1997		
	Shipments			Shipments		
	Production	Quantity	Value	Production	Quantity	Value
<b>Total .....</b>	<b>551,914</b>	<b>283,089</b>	<b>512,688</b>	<b>r/ 525,833</b>	<b>r/ 249,800</b>	<b>r/ 465,543</b>
Northeast Region .....	9,824	9,686	36,473	10,299	10,384	36,114
North Central Region	54,641	6,290	24,474	53,666	4,608	16,767
East North Central .....	(D)	(D)	(D)	(D)	(D)	(D)
West North Central .....	(D)	(D)	(D)	(D)	(D)	(D)
South Region .....	370,387	(D)	(D)	347,295	(D)	(D)
South Atlantic .....	8,783	1,394	5,536	9,471	2,192	6,623
East South Central .....	8,317	(D)	(D)	r/ 8,699	(D)	(D)
West South Central .....	353,287	196,736	331,635	329,125	r/ 166,141	r/ 297,675
West Region .....	117,062	(D)	(D)	r/ 114,573	(D)	(D)

D Withheld to avoid disclosing data for individual companies. r/Revised by 5 percent or more from previously published data.

See end of Table 6 for explanation of geographic areas.

**Table 6. Production and Shipments of Liquid Nitrogen and Oxygen Produced for Merchant Shipment by Geographic Area: 1998 and 1997**

[Production and quantity in million cubic feet. Value in thousands of dollars]

Geographic area	Nitrogen					
	1998			1997		
	Production	Shipments		Production	Shipments	
	Quantity	Value	Quantity	Value	Quantity	Value
<b>Total .....</b>	<b>250,062</b>	<b>243,637</b>	<b>732,411</b>	<b>239,154</b>	<b>243,915</b>	<b>639,064</b>
Northeast Region .....	48,946	48,797	125,468	49,211	48,846	124,767
North Central Region .....	80,622	80,668	165,568	78,700	78,749	154,942
East North Central .....	(D)	(D)	(D)	(D)	(D)	(D)
West North Central .....	(D)	(D)	(D)	(D)	(D)	(D)
South Region .....	83,082	76,680	314,098	75,388	80,466	211,222
South Atlantic .....	36,736	30,998	98,880	34,198	39,442	90,766
East South Central .....	19,278	17,299	44,252	12,539	12,525	31,781
West South Central .....	27,068	28,383	170,966	28,651	28,499	88,675
West Region .....	37,412	37,492	127,277	35,855	35,854	148,133

  

Geographic area	Oxygen					
	1998			1997		
	Production	Shipments		Production	Shipments	
	Quantity	Value	Quantity	Value	Quantity	Value
<b>Total .....</b>	<b>113,626</b>	<b>113,245</b>	<b>363,121</b>	<b>110,260</b>	<b>110,736</b>	<b>385,446</b>
Northeast Region .....	27,651	27,648	73,196	21,043	21,062	63,158
North Central Region .....	36,041	35,929	84,163	34,072	34,334	83,930
East North Central .....	(D)	(D)	(D)	(D)	(D)	(D)
West North Central .....	(D)	(D)	(D)	(D)	(D)	(D)
South Region .....	35,681	35,433	106,083	42,945	42,992	130,033
South Atlantic .....	16,260	16,394	48,466	17,649	17,759	52,325
East South Central .....	8,306	7,825	23,796	6,515	6,512	19,000
West South Central .....	11,115	11,214	33,821	18,781	18,721	58,708
West Region .....	14,253	14,235	99,679	12,200	12,348	108,325

D Withheld to avoid disclosing data for individual companies.

Note: Northeast Region: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, and Pennsylvania. North Central Region: East North Central Division: Ohio, Indiana, Illinois, Michigan, and Wisconsin. West North Central Division: Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas. South Region: South Atlantic Division: Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida. East South Central Division: Kentucky, Tennessee, Alabama, and Mississippi. West South Central Division: Arkansas, Louisiana, Oklahoma, and Texas. West Region: Mountain: Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, and Nevada. Pacific: Washington, Oregon, California, Alaska, and Hawaii.



Table 7. Quantity of Primary Production of Specified Industrial Gases: 1998 and 1997  
 [Production in million cubic feet, except where otherwise noted]

Product code	Product description	Year	Total	First quarter	Second quarter	Third quarter	Fourth quarter
	Acetylene 1/ .....	1998	4,649	1,189	1,152	1,106	1,202
		1997 r/	4,948 r/	1,246 r/	1,149 r/	1,165 r/	1,388
3251201011	Produced for compression, including cylinder and pipeline .....	1998	666	144	131	185	206
		1997 r/	674 r/	169 r/	163 r/	161 r/	180
3251201021	Produced for pipeline shipment, excluding that shipped to be compressed, and for consumption in same plant .....	1998	3,983	1,045	1,021	921	996
		1997	4,274	1,077	985 r/	1,004 r/	1,208
	Carbon dioxide: 2/						
3251204011	Gas, including amounts produced and liquefied (short tons) .....	1998	5,649,290	(S)	(S)	(S)	(S)
		1997	5,268,818	(S)	(S)	(S)	(S)
3251204021	Liquid, including amounts produced and used to make dry ice (short tons) .....	1998	8,147,567	2,130,009	1,994,325	2,072,086	1,951,146
		1997	6,585,772 r/	1,489,067 r/	1,659,174 r/	1,595,880 r/	1,841,651
3251204031	Solid (dry ice) (short tons) .....	1998	283,702	63,396	76,561	72,610	71,135
		1997	385,556 r/	69,425 r/	75,590 r/	119,864 r/	120,677
	Argon, high purity:						
325120D021	Produced for cylinder and bulk delivery and pipeline shipments, and for consumption in same plant .....	1998	19,442	4,841	4,833	4,850	4,919
		1997	17,243	4,397	4,628 r/	4,042 r/	4,175
	Hydrogen 3/ .....	1998	551,914	126,544	136,841	141,551	146,978
		1997 r/	525,833	101,707	109,135 r/	154,996 r/	159,995
	Gas produced for:						
325120D031	Merchant shipment 4/ .....	1998	(D)	(D)	(D)	(D)	(D)
		1997	(D)	(D)	(D)	(D)	(D)
325120D041	Pipeline and onsite use 4/ .....	1998	(D)	(D)	(D)	(D)	(D)
		1997	(D)	(D)	(D)	(D)	(D)
325120D051	Consumption in same plant .....	1998	260,611	64,684	65,967	64,371	65,588
		1997	250,150 r/	43,602 r/	52,563 r/	78,551 r/	75,434
	Liquid produced for:						
325120D061	Merchant shipment 4/ .....	1998	(D)	(D)	(D)	(D)	(D)
		1997	(D)	(D)	(D)	(D)	(D)
325120D071	Other shipments or uses 4/.....	1998	291,303	61,859	70,874	77,180	81,390
		1997 r/	275,683 r/	58,105 r/	56,572 r/	76,445 r/	84,561
	Nitrogen 5/.....	1998	870,906	263,532	201,418	202,501	203,455
		1997	808,183 r/	229,089 r/	227,003 r/	175,106 r/	176,985
	Gas produced by:						
3251207011	Cryogenic onsite and pipeline 6/.....	1998	(D)	(D)	(D)	(D)	(D)
		1997	(D)	(D)	(D)	(D)	(D)
3251207021	Noncryogenic processes (psa, vpsa, membranes, etc.) by industrial gas-producing companies 6/.....	1998	565,144	185,473	126,768	126,155	126,748
		1997	524,399 r/	159,096 r/	155,803 r/	103,606 r/	105,894
	Captive uses for consumption in same plant (user-owned):						
3251207031	Cryogenic processes 7/.....	1998	(D)	(D)	(D)	(D)	(D)
		1997	(D)	(D)	(D)	(D)	(D)
3251207041	Noncryogenic processes (psa, vpsa, membrane, etc.) 7/.....	1998	(D)	(D)	(D)	(D)	(D)
		1997	(D)	(D)	(D)	(D)	(D)

Continued

Table 7. Quantity of Primary Production of Specified Industrial Gases: 1998 and 1997  
 [Production in million cubic feet, except where otherwise noted]

Product code	Product description	Year	Total	First quarter	Second quarter	Third quarter	Fourth quarter
Liquid produced for:							
3251207051	Merchant shipment .....	1998	250,062	64,246	60,671	62,738	62,407
		1997	239,154	59,648	61,176	59,844	58,486
3251207061	Consumption in same plant 7/.....	1998	19,819	5,053	5,123	5,008	4,635
		1997 r/	22,518 r/	6,029 r/	6,077 r/	5,295 r/	5,117
3251207071	Other shipments or uses .....	1998	35,881	8,760	8,855	8,600	9,666
		1997	22,112 r/	4,316 r/	3,947 r/	6,360 r/	7,488
Oxygen .....							
		1998	676,332	171,026	170,605	168,519	166,183
		1997	743,023	180,578	182,722	190,082	189,641
Gas produced by:							
325120A011	Cryogenic onsite and pipeline 8/.....	1998	(D)	(D)	(D)	(D)	(D)
		1997	(D)	(D)	(D)	(D)	(D)
325120A021	Noncryogenic processes (psa, vpsa, membranes, etc.) by industrial gas-producing companies 8/.....	1998	515,508	132,138	128,885	127,758	126,826
		1997	586,298	144,088	146,691	147,857	147,662
Captive uses for consumption in same plant (user-owned):							
325120A031	Cryogenic processes 9/.....	1998	(D)	(D)	(D)	(D)	(D)
		1997	(D)	(D)	(D)	(D)	(D)
325120A041	Noncryogenic processes (psa, vpsa, membrane, etc.) 9/.....	1998	(D)	(D)	(D)	(D)	(D)
		1997	(D)	(D)	(D)	(D)	(D)
Liquid produced for:							
325120A051	Merchant shipment .....	1998	113,626	28,681	29,650	28,657	26,638
		1997	110,260	26,174	26,372	28,689	29,025
325120A061	Consumption in same plant 9/.....	1998	23,232	4,374	5,899	5,813	7,146
		1997	29,747 r/	6,106 r/	5,769 r/	9,134 r/	8,739
325120A071	Other shipments or uses .....	1998	23,966	5,833	6,171	6,491	5,471
		1997	16,718	4,210	3,890 r/	4,402 r/	4,216

D Withheld to avoid disclosing data for individual companies. r/Revised by 5 percent or more from previously published data.  
 S Does not meet publication standards.

- 1/Excludes information from railroad ships, shipyards, welding shops, and small establishments using portable generators.
- 2/Excludes quantities produced and consumed in plants manufacturing soda ash and urea.
- 3/Excludes amounts vented, used as fuel, etc., and unspecified amount produced for sale or interplant transfers to plants consuming this gas in the production of ammonia. Also excludes amounts produced in petroleum refineries for captive use.
- 4/Product codes 325120D031, 325120D041, 325120D061, and 325120D071 have been combined to avoid disclosing data for individual companies.
- 5/Excludes amounts produced and consumed in manufacturing of synthetic ammonia derivatives.
- 6/Product codes 3251207011 and 3251207021 have been combined to avoid disclosing data for individual companies.
- 7/Product codes 3251207031, 3251207041 and 3251207061 have been combined to avoid disclosing data for individual companies.
- 8/Product codes 325120A011 and 325120A021 have been combined to avoid disclosing data for individual companies.
- 9/Product codes 325120A031, 325120A041 and 325120A061 have been combined to avoid disclosing data for individual companies.

Table 8. Production, Exports, Imports, and Apparent Consumption of Industrial Gases: 1998 and 1997  
 [Quantity in million cubic meters, unless otherwise noted]

Product code	Production description	Year	Manu- facturers' production	Exports of domestic merchan- dise 1/	Percent exports to manu- facturers' production	Imports for consump- tion2/	Apparent consump- tion 3/	Percent imports to apparent consumption
3251204	Carbon dioxide (gas, liquid, and solid (metric tons).....	1998	12,782,331	85,803	0.7	19,542	12,716,070	0.2
		1997	11,346,324	100,224	0.9	22,119	11,268,219	0.2
325120D021	Argon (high purity).....	1998	550	240	43.6	27	337	8.0
		1997	488	263	53.9	28	253	11.1
325120D 4/	Hydrogen .....	1998	15,619	272	1.7	144	15,491	0.9
		1997	r/ 14,881	298	2.0	141	14,724	1.0
3251207	Nitrogen .....	1998	24,647	94	0.4	151	24,704	0.6
		1997	22,872	80	0.3	171	22,963	0.7
325120A	Oxygen.....	1998	19,140	142	0.7	23	19,021	0.1
		1997	21,028	154	0.7	55	20,929	0.3

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

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

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

3/Apparent consumption is derived by subtracting exports from the total of production plus imports.

4/The following codes apply to hydrogen: 325120D031, 325120D041, 325120D051, 325120D061, and 325120D071.

Note: For comparison of North American Industry Classification System-Based Product Codes, Schedule B export numbers, and HTSUSA import numbers, see Table 9.

**Table 9. Comparison of North American Industry Classification System-Based Product Codes, Schedule B Export Numbers, and HTSUSA Import Numbers: 1998**

<b>Product code</b>	<b>Product description</b>	<b>Export numbers 1/</b>	<b>Import number 2/</b>
3251204	Carbon dioxide (gas, liquid and solid) (metric tons) .....	2811.21.0000	2811.21.0000
325120D021	Argon, high purity .....	2804.21.0000	2804.21.0000
325120D 3/	Hydrogen .....	2804.10.0000	2804.10.0000
3251207	Nitrogen .....	2804.30.0000	2804.30.0000
325120A	Oxygen .....	2804.40.0000	2804.40.0000

1/Source: 1998 edition, Harmonized System-Based Schedule B, Statical Classification of Domestic and Foreign Commodities Exported from the United States.

2/Source: Harmonized Tariff Schedule of the United States, Annotated (1998).

3/The following codes apply to hydrogen: 325120D031, 325120D041, 325120D051, 325120D061, and 325120D071.