IRON AND STEEL

By Gerald W. Houck

Iron and steel are vital to the United States for both national security and economic well-being. They are the basic metals of an industrial society. Although there are many acceptable substitutes for many of their uses, in the short term, there are no practical substitutes on a large scale because of the cost and lack of availability of alternative materials.

Data tables on ferroalloys production and consumption are contained in this chapter. Ferroalloys are alloys of iron that contain a sufficient amount of one or more other chemical elements to be useful as an agent to introduce these other elements into a molten metal, usually steel. The reader is referred to the Annual Reports dealing with specific elements, especially those for chromium, manganese, and silicon, for analysis and detail with respect to the ferroalloys industry.

Consistent with international usage, the U.S. Bureau of Mines is reporting all data on iron and steel in metric units, unless otherwise noted.

This was a turnaround year for the U.S. steel industry. Demand for steel products was strong and resulted in markedly improved prices. Largely as a result of the improved pricing, all major U.S. steel companies reported operating profits for the year. Production of raw steel in the United States increased 2.7%, to 91.2 million metric tons, from 88.8 million tons produced in 1993. Net shipments of steel mill products by U.S. companies increased 6.8% to 86.3 million tons, from 80.8 million tons in 1993. Shipments of U.S. steel companies were inflated by a major increase in imports of semifinished steel with which they supplemented raw steel production capability.

Imports of steel mill products increased about 54%, to 27.3 million tons, from 17.7 million tons in 1993. Imports captured 26% of the apparent consumption of steel mill products, up from 19% in 1993. Imports of fabricated steel products, such as fasteners, wire, and fabricated structural steel, totaled 2.4 million tons, representing another 2% of the U.S. steel market.

Exports of steel mill products declined to 3.5 million tons, from 3.6 million tons in 1993.

Prices of steel mill products in the United States increased in 1994. The Bureau of Labor Statistics' Producer Price Index for steel mill products increased about 4.8% to 113.4 (1982 base=100.0).

World production of raw steel in 1994 was 726 million tons, down slightly from that of 1993. Production continued to decline in the states that comprise the former U.S.S.R., dropping about 20 million tons in 1994, but elsewhere in the world, steel production increased about 5%, offsetting the decline.

Production

Production of raw steel in the United States increased 2.7% to 91.2 million metric tons, from 88.8 million tons produced in 1993. Raw steel production capability was estimated by American Iron and Steel Institute (AISI) as 98.1 million tons, down from 99.7 million tons in 1993. Production in 1994 represented 93.0% of estimated capability, compared with 89.1% in 1993.

Net shipments of steel mill products by U.S. companies increased about 7%, to 86.3 million tons, from 80.8 million tons in 1993. "Steel mill products" refers to products produced by a steel mill, either by forging or rolling, in the form normally delivered for fabrication or use. Some companies purchase semifinished steel mill products from other steel companies and use these semifinished products to produce steel mill products. To avoid double counting steel mill product shipments under these circumstances, steel mills identify any shipments of steel mill products to other companies that are reporters of steel mill product shipments. The accumulated shipments of all companies, less the shipments to other reporting companies, are identified as "net" shipments.

Basic oxygen steelmaking was utilized for 55.4 million tons, 60.7% of raw steel production in 1994. Basic oxygen furnaces are used by integrated steel producers that smelt iron ores to crude liquid iron in blast furnaces and refine the iron, with some scrap, in basic oxygen furnaces, producing liquid steel. The liquid steel is mostly cast into semifinished products in continuous casting machines, although 10% of U.S. production in 1994 was cast in ingot form and subsequently rolled into semifinished form. The integrated steel industry in the United States in 1994 consisted of 15 companies operating ironmaking and steelmaking facilities at 22 locations. Several of these companies also operated nonintegrated plants and/or other steelmaking facilities at the same locations.

Electric arc furnace steelmaking was utilized for 35.9 million tons, 39.3% of total steelmaking in 1994. Electric arc furnaces are used by nonintegrated steel producers to melt raw materials, primarily scrap. Broadly speaking, there are two subcategories of nonintegrated mills: minimills and specialty mills. "Minimills" is a term used to describe steel producers that utilize modern technology in a plant built to produce a limited product line with maximum efficiency. These plants always incorporate electric melting of low-cost raw materials, continuous casting, and a hot-rolling mill, often closely coupled to the casting operation.

The second category of nonintegrated mills, specialty mills, includes producers of stainless steel, alloy electrical steel, tool steel, and high-temperature alloys. In addition, this category includes producers of forging ingots and a number of steel plants that produce lower volume steel products.

Overall, the nonintegrated sector of the industry consisted of about 60 companies with 91 raw-steelmaking locations.

The trend toward the use of continuous casting continued. Continuous casting production was 82.7 million tons, 89.5% of total raw steel production, compared with 76.1 million tons, 85.7% in 1993.

Data regarding U.S. production of iron and steel, and shipments of steel mill products are those reported by AISI . These data can be regarded as representing 100% of the raw steel producers in the United States.

Consumption

Shipments of steel mill products by U.S. companies were up 6.8%, to 86.3 million tons, but export shipments continued to drop; exports were down 19% from those of 1993. Shipments to domestic customers were up more than 7%. Shipments to the largest single end-use market–the automotive market–were up 16%, appliances were up 9%, service centers and distributors increased 2%, and construction

products rose about 6%. Shipments of steel for containers, packaging and shipping materials increased 3%; for oil and gas drilling, mining, quarrying, and lumbering increased 8% from the 1993 level; and shipments for industrial and agricultural machinery, equipment, and tools increased 6%.

Prices

Prices for steel mill products increased steadily through 1994. On a year-to-year average basis, the Bureau of Labor Statistics' Producer Price Index for steel mill products was up by 5% in 1994 at 113.4 (1982 base=100). Price increases were announced, effective in January 1995, and the outlook was for further price increases in 1995.

Foreign Trade

Exports of steel mill products declined to 3.5 million tons, from 3.6 million tons in 1993. Canada was again the nation receiving the largest amount of U.S. exported steel, 1.9 million tons, with Mexico again in second place, receiving 0.7 million tons.

Imports of steel mill products increased to 27.3 million tons from 17.7 million tons in 1993, an increase of 54%. Brazil, Canada, the European Union (EU), Japan, Korea, Mexico, and Russia were major sources for steel mill product imports. One of the most significant developments was the emergence of Russia and Ukraine as major sources of imported steel. In 1994, over 2 million tons of steel mill products were imported from Russia and Ukraine.

A second important development in 1994 was the continued high volume of imported semifinished steel for rolling in the United States. During the period 1985 through 1992, imports of semifinished steel had been about 2 million metric tons per year. This steel, primarily in the form of slabs suitable for rolling into sheet or plate mill products, was imported and utilized mostly by companies that lack steelmaking facilities. In 1993, imports of semifinished steel increased to 4.5 million tons, and in 1994, further increased to 7.2 million tons. Almost all of the increased tonnage is believed to have been imported by companies within the steel industry itself to supplement steelmaking capacity. Excluding this major increase in imports of semifinished steel, steel mill product imports in 1994 were 20.1 million tons, an increase of 52% over that of 1993.

The increase in imports of semifinished steel by steel companies must be taken into consideration in evaluating total consumption of steel mill products in the United States and the share of the market represented by imported steel. To avoid counting both the imported semifinished steel and the products produced from it, it is necessary to subtract from domestic consumption the amount of semifinished steel consumed by companies that also produce raw steel. For 1994, this amount is estimated to have been 5 million tons. For years prior to 1993, the amount was less than 0.5 million tons per year, and for 1993, the amount of such imports was estimated to be 2.5 million tons. Taking the imported semifinished steel into consideration, the share of the U.S. steel market represented by imported steel was 26% in 1994 compared with 19% in 1993.

Regarding the reporting of imports and exports, "fabricated steel products" are products produced from steel mill products, but not including products that incorporate steel products along with other materials. Examples of fabricated steel products are fabricated structural steel and steel fasteners. "Other iron and steel products" refers to products that are not produced from steel mill products. Examples of other iron and steel products include iron or steel castings and direct-reduced iron (DRI).

World Review

World production of pig iron and DRI in 1994 totaled 540 million tons, an increase of 2% compared with that of 1993. Pig iron production, however, was up only 1%, while DRI production continued to expand rapidly, increasing 18% in the latest year and 67% over the past 5 years. Direct reduction of iron ore has proved to be a cost-effective way for developing countries, especially those with an abundance of natural gas, to encourage economic growth.

Pig iron production in most of the developed world increased about 2% to 5%, and China and India experienced double-digit growth. China is now the leading pig iron producing nation in the world, by a wide margin. A decline of 18% in the former U.S.S.R. offset increases in the rest of the world.

World production of DRI increased to almost 28 million tons in 1994, with a 17% increase in the latest year and 67% over the past 5 years. Direct reduction of iron ore has proved to be a cost-effective way for developing countries, especially those with an abundance of natural gas, to encourage economic growth.

World capacity for DRI production was estimated to be 40 million tons, with an additional 2 million tons under construction. In India, one gas-based plant and several small coal-based DRI plants were started up, bringing India's capacity for DRI to 4.8 million tons. An additional 1 million tons of capacity is under construction in India, with completion planned for 1995-97.

In Iran, about 1.8 million tons of DRI capacity was started up in 1994, bringing Iran's total capacity for DRI to 5.8 million tons.

A United States minimill company started up a gas-based direct-reduction plant in Trinidad. The plant utilizes a technology never before used in a production scale operation, and produces a unique form of direct-reduced iron in which all of the reduced iron will be in the form of iron carbide (Fe_3C), rather than in elemental form. (About 7% or 8% of the iron remains in oxide form in all direct-reduced iron products.) The resultant product, called "iron carbide," will be imported to the United States to serve as a high-quality charge material for the production of flat-rolled products in the minimills operated by the company.

World production of steel in 1994 was 726 million tons, slightly less than that of 1993. The world picture, however, was mixed, with modest growth throughout the world except in the newly independent states of the former U.S.S.R. The 12 newly independent states had combined steel production of 78 million tons, down 20% from that of 1993. As recently as 1989, the U.S.S.R. had produced more than 160 million tons of raw steel.

In the former Soviet satellite states of Eastern Europe, growth in steel production was resumed, with 1994 production of 32 million tons, an increase of 8% over that of 1993. The six nations of this region—Bulgaria, Czech Republic, Hungary, Poland, Romania, and Slovakia—had produced about 52 million tons of raw steel in 1989.

Outlook

The outlook for 1995 is for growth in world steel production of about 5% worldwide. In the former U.S.S.R., the decline appears to have been arrested, and modest growth is expected.

For the long term, little growth of steel consumption is expected in the United States or countries with highly developed economies. Steel consumption tends to expand much more slowly than overall economic growth and to contract when economic growth is weak. The outlook for the U.S. steel industry is more uncertain. Imports have tended to capture an increasing share of the U.S. market, except when restrained by such devices as the voluntary restraint agreements that were in place from 1984 through 1992. U.S. companies have made great progress in modernizing mills, adopting efficient technology, and reducing cost. With improved demand in 1994, they have been able to achieve a level of profitability that has attracted a rash of new capacity

construction. New minimills, mostly to produce flat rolled steel products, will start up in 1995 through 1997, adding 5 million tons to steelmaking capacity in the United States. Some observers of the industry predict that as much as 20 million tons of new capacity will be built by about the year 2000. With expected growth in the market, new capacity will have to displace either imports or integrated production from the U.S. market.

The supply of raw material for the increased minimill production may become a problem in the United States. Although the United States traditionally has an excess supply of scrap and is a net exporter of scrap, the supply of low residual scrap necessary to produce flat-rolled steel and some other products may not be adequate. During 1994, the need for low residual material was met by a combination of imported DRI and pig iron.

OTHER SOURCES OF INFORMATION

American Metal Market, daily.

Annual Statistical Report, American Iron and Steel Institute, Washington, DC.

Directory of Iron and Steel Plants, Association of Iron and Steel Engineers, Pittsburgh, PA.

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HYL, the Iron & Steel Technology Division of Hylsa, S.A. de C.V. HYL Report.

Making, Shaping and Treating of Steel, Association of Iron and Steel Engineers, Pittsburgh, PA.

Metal Bulletin, biweekly.

Midrex Corporation. Direct From Midrex. Quarterly.

Steel Manufacturers Association, Washington, DC.

Steel Statistical Yearbook, International Iron and Steel Institute, Brussels, Belgium.

Steel Times International.

TABLE 1
SALIENT IRON AND STEEL STATISTICS 1/

(Thousand metric tons)

	1990	1991	1992	1993	1994
United States:					
Pig iron:					
Production 2/	49,700	44,100	47,400	48,200	49,400
Exports	14	15	33	27	56
Imports for consumption	347	434	497	828	2,490
Direct-reduced iron:					
Production	390	410	390	440	480
Exports	4 r/	4 r/	9 r/	15 r/	16
Imports for consumption	333 r/	365 r/	542 r/	1,090 r/	1,170
Raw steel production: 3/					
Carbon steel	78,600	70,700	74,800	78,800	81,200
Stainless steel	1,850	1,700	1,810	1,770	1,840
All other alloy steel	9,330	7,380	7,710	8,220	8,180
Total	89,700	79,700	84,300	88,800	91,200
Capability utilization, percent	84.7	74.7	82.2	89.1	93.0
Steel mill products:					
Net shipments	77,100	71,500	74,600	80,800	86,300
Exports 4/	3,900	5,760	3,890	3,600	3,470
Imports 4/	15,600	14,400	15,500	17,700	27,300
Producer price index for steel mill products 5/ (1982=100.0)	112.1	109.5	106.4	108.2	113.4
World production: 6/					
Pig iron	531,000 r/	509,000 r/	503,000 r/	506,000 r/	512,000
Direct-reduced iron	18,200	19,400	20,900	23,800	27,800
Raw steel	771,000	736,000	724,000 r/	728,000 r/	726,000 e/

e/ Esitmated. r/ Revised.

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits except prices; may not add to totals shown.

2/ American Iron and Steel Institute (AISI).

3/ Raw steel is defined by AISI as steel in the first solid state after melting, suitable for rolling.

4/ Source: Bureau of the Census.

5/ Source: Bureau of Labor Statistics.

6/ Sources: U.S. Bureau of Mines and International Iron and Steel Institute.

TABLE 2
MATERIALS CONSUMED IN BLAST FURNACES AND PIG IRON PRODUCED 1/

(Thousand metric tons)

Material	1993	1994
Iron oxides: 2/		
Ores	1,960	1,820
Pellets	60,700	61,100
Sinter 3/	12,500	12,100
Total	75,100	75,100
Scrap 4/	1,920	1,800
Coke 2/	21,500	22,000
Pig iron produced	48,200	49,400

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ American Iron and Steel Institute.

3/ Includes sintered ore and pellet fines, dust, mill scale, and other revert iron-bearing materials; also some nodules.

4/ Mainly briquetted turnings and borings, shredded scrap, etc.; scrap produced at blast furnaces and remelt not included.

TABLE 3
DISTRIBUTION OF SHIPMENTS OF STEEL MILL PRODUCTS, BY STEEL TYPE, PRODUCT, AND MARKET 1/

	Thousand metric tons		Percent	
	1993	1994	1993	1994
Shipments by steel type:				
Carbon steel	75,400	80,300	93.4	93.1
Alloy steel	3,970	4,410	4.9	5.1
Stainless steel	1,390	1,560	1.7	1.8
Total shipments by steel type	80,800	86,300	100.00	100.00
Steel mill products:				
Ingots, blooms, billets and slabs	2,330	2,300	2.89	2.66
Wire rods	4,400	4,370	5.45	5.06
Structural shapes-heavy	4,510	5,000	5.59	5.79
Steel piling	389	395	.48	.46
Plates-cut lengths	4,330	4,760	5.36	5.52
Plates-in coils	2,510	3,000	3.11	3.48
Rails	498	453	.62	.52
Railroad accessories	117	119	.14	.14
Bars-hot-rolled	5,750	6,430	7.12	7.45
Bars-light-shaped	1,320	1,550	1.64	1.80
Bars-reinforcing	4,570	4,470	5.65	5.18
Bars-cold finished	1,430	1,620	1.77	1.88
Tool steel	61	60	.08	.07
Pipe and tubing-standard pipe	1,030	1,040	1.28	1.20
Pipe and tubing-oil country goods	1,190	1,210	1.48	1.40
Pipe and tubing-line pipe	745	1,030	.92	1.19
Pipe and tubing-mechanical tubing	804	939	1.00	1.09
Pipe and tubing-pressure tubing	45	35	.06	.04
Pipe and tubing-stainless	23	23	.03	.03
Pipe and tubing-structural	158	176	.20	.20
Pipe for piling	32	56	.04	.06
Wire	728	714	.90	.83
Tin mill products-blackplate	274	287	.34	.33
Tin mill products-tinplate	2,510	2,520	3.10	2.92
Tin mill products-tin-free steel	872	856	1.08	.99
Tin mill products-tin coated sheets	88	92	.11	.11
Sheets-hot-rolled	13,500	14,200	16.70	16.50
Sheets-cold-rolled	11,600	11,800	14.30	13.70
Sheets and strip-hot dip galvanized	8,810	9,930	10.90	11.50
Sheets and strip-electrogalvanized	2,940	3,340	3.64	3.88
Sheets and strip-other metallic coated	1,400	1,550	1.73	1.80
Sheets and strip-electrical	403	399	.50	.46
Strip-hot rolled	567	646	.70	.75
Strip-cold rolled	851	887	1.05	1.03
Total-steel mill products	80,800	86,300	100.00	100.00
Shipments by markets:				
Service centers and distributors	21,500	21,900	26.60	25.40
Construction	12,200	13,000	15.10	15.00
Automotive	11,500	13,400	14.30	15.50
Machinery	6,260	6,690	7.75	7.75
Containers	3,950	4,080	4.89	4.73
All others	25,300	27,200	31.30	31.60
Total shipments by market	80,800	86,300	100.00	100.00

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

Source: American Iron and Steel Institute.

TABLE 4
U.S. IMPORTS AND EXPORTS OF STEEL MILL PRODUCTS, BY COUNTRY 1/

(Thousand metric tons)

Country	1993		1994	
	Imports	Exports	Imports	Exports
Argentina	131	13	200	5
Australia	398	9	398	11
Brazil	1,280	22	2,040	11
Bulgaria	11	--	198	--
Canada	4,350	1,520	4,150	1,880
China	37	78	115	41
European Union	6,190	115	8,460	119
Finland	184	--	224	3
India	119	24	188	33
Japan	1,620	94	3,220	31
Korea, Republic of	911	25	1,320	15
Mexico	767	861	1,590	734
Russia	170	32	1,600	5
Slovakia	43	--	178	--
South Africa, Republic of	368	4	431	8
Sweden	251	1	273	2
Taiwan	64	235	184	12
Trinidad and Tobago	95	21	220	6
Turkey	96	2	407	1
Ukraine	122	--	479	1
Venezuela	131	23	398	49
Other	342	519	999	506
Total	17,700	3,600	27,300	3,470

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

Source: American Iron and Steel Institute.

TABLE 5
U.S. EXPORTS OF IRON AND STEEL PRODUCTS 1/

(Thousand metric tons)

	1993	1994
Steel mill products:		
Ingots, blooms, billets, and slabs	487	143
Wire rods	57	31
Structural shapes-heavy	290	326
Steel piling	6	11
Plates-cut lengths	168	139
Plates-in coils	99	123
Rails-standard	19	8
Rails-other	2	6
Railroad accessories	20	23
Bars-hot-rolled	246	248
Bars-light-shaped	59	72
Bars-concrete reinforcing	206	96
Bars-cold-finished	63	84
Tool steel	6	5
Pipe and tubing-standard pipe	37	51
Pipe and tubing-oil country goods	156	209
Pipe and tubing-line pipe	114	273
Pipe and tubing-mechanical tubing	13	13
Pipe and tubing-stainless	13	16
Pipe and tubing-nonclassified	158	177
Pipe and tubing-structural	21	33
Pipe for piling	5	2
Wire	82	90
Tin mill products-blackplate	6	5
Tin mill products-tinplate	175	189
Tin mill products-tin-free steel	64	35
Sheets-hot-rolled	136	166
Sheets-cold-rolled	328	404
Sheets and strip-hot-dip galvanized	142	130
Sheets and strip-electrogalvanized	101	54
Sheets and strip-other metallic coated	123	101
Sheets and strip-electrical	47	40
Strip-hot-rolled	42	60
Strip-cold-rolled	111	108
Total steel mill products	3,600	3,470
Fabricated steel products:		
Structural shapes-fabricated	203	215
Rails-used	35	33
Railroad products	28	35
Wire rope	8	7
Wire-stranded products	19	22
Wire-other products	22	17
Springs	27	43
Nails and staples	16	20
Fasteners	166	369
Chains and parts	21	24
Grinding balls	29	24
Pipe and tube fittings	22	21
Other 2/	34	37
Total fabricated steel products	631	866
Total all steel products	4,230	4,340
Cast iron and steel products:		
Cast steel pipe fittings	74	52
Cast iron pipe and fittings	16	25
Cast steel rolls	12	12
Cast grinding balls	16	22
Granules-shot and grit	29	32
Other castings	32	41
Total cast iron and steel products	180	183

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Includes shapes-cold formed, sashes and frames, fence and sign post, and architectural and ornamental work.

Source: American Iron and Steel Institute.

TABLE 6
U.S. IMPORTS OF MAJOR IRON AND STEEL PRODUCTS1/

(Thousand metric tons)

	1993	1994
Steel mill products:		
Ingots, blooms, billets and slabs	4,530	7,200
Wire rods	1,230	1,520
Structural shapes-heavy	478	662
Steel piling	66	62
Plates-cut lengths	692	1,340
Plates-in coils	549	890
Rails and railroad accessories	120	191
Bars-hot-rolled	870	1,030
Bars-light-shaped	114	116
Bars-reinforcing	109	298
Bars-cold-finished	233	272
Tool steel	80	107
Pipe and tubing-standard pipe	549	751
Pipe and tubing-oil country goods	321	310
Pipe and tubing-line pipe	467	591
Pipe and tubing-mechanical tubing	178	239
Pipe and tubing-pressure tubing	34	33
Pipe and tubing-stainless	39	44
Pipe and tubing-nonclassified	10	11
Pipe and tubing-structural	262	326
Pipe for piling	7	6
Wire	479	538
Tin mill products-blackplate	77	148
Tin mill products-tinplate	236	334
Tin mill products-tin-free steel	115	160
Sheets-hot-rolled	2,060	4,000
Sheets-cold-rolled	1,920	3,770
Sheets and strip-hot-dip galvanized	1,150	1,530
Sheets and strip-electrogalvanized	185	204
Sheets and strip-other metallic coated	133	199
Sheets and strip-electrical	104	91
Strip-hot-rolled	135	105
Strip-cold-rolled	151	194
Total steel mill products	17,700	27,300
Fabricated steel products:		
Structural shapes-fabricated	176	153
Rails-used	70	183
Railroad products	50	68
Wire rope	75	78
Wire-stranded products	122	105
Wire-other products	74	90
Springs	239	298
Nails and staples	324	337
Fasteners	730	820
Chains and parts	74	88
Pipe and tube fittings	83	90
Other	34	49
Total fabricated steel products	2,050	2,360
Total all steel products	19,700	29,600
Cast iron and steel products:		
Cast steel pipe fittings	25	28
Cast iron pipe and fittings	21	34
Other products	182	211
Total cast products	228	272

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

Source: American Iron and Steel Institute.

TABLE 7
U.S. IMPORTS OF STAINLESS STEEL 1/

(Metric tons)

Product	1993	1994
Semifinished	103,000	137,000
Plate	55,600	107,000
Sheet and strip	288,000	328,000
Bars and shapes	67,800	75,600
Wire and wire rods	56,900	69,700
Pipe and tube	39,500	44,400
Total	611,000	762,000

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

Sources: American Iron and Steel Institute.

TABLE 8
U.S. SHIPMENTS OF IRON AND STEEL CASTINGS 1/

(Thousand metric tons)

	1993 r/ 2/	1994
Ductile iron castings	3,400	3,830
Gray iron castings	8,280	9,410
Malleable iron castings	265	272
Steel castings	1,330	1,620
Steel investment castings	37	43
Total	13,300	15,200

r/ Revised.
1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.
2/ Data for years prior to 1993 may not be comparable due to expanded coverage of the Iron and Steel Casting Industries.

Source: Bureau of the Census.

TABLE 9
COAL AND COKE AT COKE PLANTS 1/ 2/

(Thousand metric tons)

	1993	1994
Coal: Consumption	28,400	28,800
Coke: 3/		
Production	21,000	20,600
Exports	757	599
Imports	1,390	1,460
Consumption, apparent	22,000	21,900

1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.
2/ Includes furnace and merchant coke plants.
3/ Coke production and consumption do not include breeze.

Source: Energy Information Administration, Quarterly Coal Report (DOE/EIA-0121).

TABLE 10
RAW STEEL: 1/ WORLD PRODUCTION, BY COUNTRY 2/ 3/

(Thousand metric tons)

Country 4/	1990	1991	1992	1993	1994 e/
Albania e/	65	35	5	5	5
Algeria	836	1,390	1,000 r/ e/	865 r/ e/	807
Angola e/	10	10	10	9	9
Argentina	3,640	2,990 r/	2,700 r/	2,870 r/	3,300
Australia	6,670	6,020	6,870	7,840 r/	8,430
Austria	4,240 r/	3,900 r/	3,600 r/	2,970 r/	4,400 5/
Azerbaijan	XX	XX	385 r/	228 r/	36
Bangladesh 6/	75	58	36	32	34
Belarus	XX	XX	1,110 r/	947 r/	873
Belgium	11,400	11,300	10,300	10,200 r/	11,200 5/
Benin e/	8	8	8	2 r/	--
Bosnia and Herzegovina e/	XX	XX	135	115	100
Brazil 7/	20,600	22,600	24,000	25,200 r/	25,700
Bulgaria	2,180 r/	1,620	1,550	1,940 r/	2,000
Canada	12,300	13,000	13,900	14,300 r/	13,900 5/
Chile 7/	772	807 r/	1,010 r/	1,060 r/	1,040
China e/	66,100	70,600	80,000	88,700	91,500
Colombia	701	652	657	687 r/	702 5/
Croatia	XX	XX	102 r/	74 r/	73
Cuba e/	255 r/	180 r/	134 r/	90 r/	80
Czech Republic	XX	XX	XX	6,730 r/	7,090
Czechoslovakia 8/	14,800	12,100	10,500	XX	XX
Denmark	610	633	591	603 r/	723 5/
Dominican Republic	36	39	33 r/ e/	-- r/	--
Ecuador	20	20	20	27 r/	22 5/
Egypt	2,240	2,540	2,500 e/	2,500 e/	2,500
El Salvador e/	21 r/	23 r/	25 r/	24 r/	24
Finland	2,860	2,890	3,080 r/	3,260 r/	3,420 5/
France	19,000	18,400	18,000	17,200	18,000 5/
Georgia	XX	XX	529 r/	215 r/	116
Germany:					
Eastern states	5,550	XX	XX	XX	XX
Western states	38,400	XX	XX	XX	XX
Total	44,000	42,200	39,700	37,600	40,800 5/
Greece	999	980	923 r/	980 r/	848 5/
Guatemala	21	23	25 r/	25 r/	24
Honduras e/	8	-- r/	-- r/	-- r/	--
Hong Kong e/	350	350	350	350	350
Hungary	2,960	1,930	1,560	1,750 r/	1,940 5/
India	15,000 r/	17,100 r/	18,100 r/	18,200 r/	18,200 5/
Indonesia	2,890	3,250	3,170	1,950 r/	2,000
Iran	1,430	2,200	2,940 r/	3,670	4,500 5/
Iraq e/	150	20	100	300 r/	300
Ireland	326	307	257	326 r/	325
Israel e/	144	160	160	160	160
Italy	25,400	25,000	24,900	25,700	26,100 5/
Jamaica e/	24	25	25	25	25
Japan	110,000	110,000	98,100 r/	99,600	98,300 5/
Jordan	179	200	244	181 r/	181
Kazakhstan	XX	XX	5,680 r/	4,280 r/	2,840
Korea, North e/	8,000	8,000	8,100	8,100	8,100
Korea, Republic of	23,100	26,000	28,100	33,000	33,700
Latvia	XX	XX	246	300	332
Libya	492	718	822	920 r/	920
Luxembourg	3,560	3,380	3,070	3,290 r/	3,090 5/
Macedonia	XX	XX	202 r/	137 r/	90
Malaysia	1,200	1,130 r/	1,560 r/	1,810 r/	1,850
Mexico	8,730	7,960 r/	8,460 r/	9,190	10,200 5/
Moldova	--	--	619 r/	604 r/	632
Morocco e/	7	7	7	7	7
Netherlands	5,410	5,170	5,440	6,000	6,170
New Zealand	719 r/	806 r/	759	853 r/	766 5/
Nigeria	133	137	140 e/	140 e/	140
Norway	383 r/	438	446	505 r/	456 5/

See footnotes at end of table.

TABLE 10--Continued
RAW STEEL: 1/ WORLD PRODUCTION, BY COUNTRY 2/ 3/

(Thousand metric tons)

Country 4/	1990	1991	1992	1993	1994 e/
Pakistan e/	1,000	1,000	1,000	1,100	1,100
Paraguay	48	61	86	86	86
Peru	284	418	338	338 e/	338
Philippines	600 r/	605 r/	497 r/	623 r/	640
Poland	13,600	10,400	9,870	9,940	11,100 5/
Portugal	744	541	749	750	720
Qatar	580	561	588	580	580
Romania	9,760	7,130 r/	5,380 r/	5,450 r/	5,570
Russia	XX	XX	67,000	58,300 r/	48,800
Saudi Arabia	1,830	1,790 r/	1,830 r/	2,320 r/	2,410
Serbia and Montenegro	XX	XX	665	183 r/	137
Singapore e/	489 5/	490	500	500	500
Slovakia e/	XX	XX	XX	3,920 r/	3,950
Slovenia e/	XX	XX	300	300	300
South Africa, Republic of	8,620	9,360	9,060	8,730 r/	8,320 5/
Spain	12,700	12,900	12,300	12,600 r/	13,600 5/
Sweden	4,450	4,250	4,360	4,590 r/	4,950 5/
Switzerland	1,110 r/	1,110 r/	1,210 r/	1,260 r/	800
Syria	76 r/	63 r/	70 e/	70 e/	70
Taiwan	9,750	11,000	10,700	12,000	11,500
Thailand	685	711	779	954 r/	1,000
Trinidad and Tobago	372	444	553	515	631 5/
Tunisia	177	193	181	190 e/	190
Turkey	9,410 r/	9,400 r/	10,300	11,500 r/	12,100 5/
Ukraine	XX	XX	41,800 r/	32,400 r/	23,800
U.S.S.R. 9/	154,000	133,000	XX	XX	XX
United Kingdom	17,900	16,500	16,200 r/	16,700 r/	17,400 5/
United States	89,700	79,700	84,300	88,800	91,200 5/
Uruguay	38	44	53	53	53
Uzbekistan	XX	XX	630 r/	573 r/	352
Venezuela	3,180	3,120	3,200	3,250	3,410 5/
Vietnam	102	103 r/	219 r/	270 r/	300
Yugoslavia 10/	3,840	2,140	XX	XX	XX
Zimbabwe	580	581	547	221 r/	180 r/
Total	771,000	736,000	722,000	728,000 r/	726,000

e/ Estimated. r/ Revised. XX Not applicable.

1/ Steel formed in first solid state after melting, suitable for further processing or sale; for some countries, includes material reported as "liquid steel," presumably measured in the molten state prior to cooling in any specific form.

2/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

3/ Table includes data available through July 12, 1995.

4/ In addition to the countries listed, Burma, Ghana, and Mozambique are known to have steelmaking plants, but available information is inadequate to make reliable estimates of output levels.

5/ Reported figure.

6/ Data are for year ending June 30 of that stated.

7/ Excludes castings.

8/ Dissolved on Dec. 31, 1992.

9/ Dissolved in Dec. 1991.

10/ Dissolved in Apr. 1992.

TABLE 11
PIG IRON 1/ AND DIRECT-REDUCED IRON: 2/ WORLD PRODUCTION, BY COUNTRY 3/ 4/

(Thousand metric tons)

Country 5/	1990	1991	1992	1993	1994 e/
Albania e/	96 6/	50	10	10	1
Algeria	1,040	877	1,100 r/	850 r/	830 6/
Argentina:					
Pig iron	1,930 r/	1,310 r/	966 r/	986 r/	1,390 6/
Direct-reduced iron	1,040 r/	954	1,030 r/	1,160 r/	1,270 6/
Australia	6,130	5,650	6,390 r/	6,770 r/	7,470 6/
Austria	3,450	3,440	3,070	3,390 r/	3,360 6/
Belgium	9,420	9,350	8,530 r/	8,180 r/	9,030 6/
Bosnia and Herzegovina	XX	XX	150	100 e/	100
Brazil:					
Pig iron	21,100	22,700	23,200	24,000 r/	25,200 6/
Direct-reduced iron	260	226	230	240	220 6/
Bulgaria	1,140	943	837 r/	998 r/	900
Burma:					
Pig iron	3 r/	1	1 r/	2 r/	2
Direct-reduced iron e/	20	20	20	20	20
Canada:					
Pig iron	7,350	8,270	8,620	8,630	8,150 6/
Direct-reduced iron	730	553	639	758	770 6/
Chile	675	703	873 r/	917 r/	900
China	62,400	67,700 r/	75,900 r/	87,400 r/	96,400 6/
Colombia	323	305	308	238	250
Croatia e/	XX	XX	40	40	40
Czech Republic e/	XX	XX	XX	4,670 r/	5,290 6/
Czechoslovakia 7/	9,670	8,480	8,040	XX	XX
Egypt:					
Pig iron	1,100	1,250 e/	1,200 e/	1,130	1,100
Direct-reduced iron e/	710 6/	620	850	800	800
Finland	2,280	2,330	2,450	2,540 r/	2,600 6/
France	14,400	13,600	13,100	12,700 r/	13,300 6/
Georgia	XX	XX	274 r/	88 r/	--
Germany:					
Pig iron:					
Eastern states 8/	2,160	XX	XX	XX	XX
Western states	29,600	XX	XX	XX	XX
Total	31,000 r/	31,000 r/	28,500	27,000	29,900 6/
Direct-reduced iron: Western states e/	310	260	250	250	200
Hungary	1,700	1,310	1,180	1,410 r/	1,590 6/
India:					
Pig iron	12,600	14,200	15,100 r/	15,700 r/	17,300 6/
Direct-reduced iron e/	750	1,180	1,440 6/	2,210 r/ 6/	3,120 6/
Indonesia: Direct-reduced iron e/	1,300	1,350	1,400	1,400	1,620 6/
Iran:					
Pig iron	1,270	1,950	2,050	1,960	1,880 6/
Direct-reduced iron	264	470	709	1,630	2,860 6/
Iraq: Direct-reduced iron e/	170	--	--	--	--
Italy	11,900	10,900	10,500	11,100 r/	11,200 6/
Japan	80,200	80,000	73,100	73,700	73,800 6/
Kazakhstan	XX	XX	4,660 r/	3,540 r/	2,430
Korea, North e/	6,500	6,500	6,600	6,600	6,600
Korea, Republic of	15,300	18,500	19,300	22,000 e/	21,200
Libya: Direct-reduced iron e/	500	780	850	944 r/ 6/	852 6/
Luxembourg 8/	2,650	2,460	2,260	2,410 r/	1,930 6/
Macedonia	XX	XX	20	20 e/	20
Malaysia: Direct-reduced iron e/	600	600	600	600	1,000
Mexico:					
Pig iron	3,670 r/	2,960 r/	3,400	3,420	3,500 6/
Direct-reduced iron	2,530	2,460	2,390	2,740	3,220
Morocco e/	15	15	15	15	15
Netherlands 8/	4,960	4,700	4,850	5,410 r/	5,440 6/
New Zealand: Direct-reduced iron	549	594	384	406	563 6/
Nigeria: Direct-reduced iron e/	140	140	140	100	100
Norway	54	61	70 r/	73 r/	70
Pakistan e/	1,000	1,100	1,100	1,200	1,200

See footnotes at end of table.

TABLE 11--Continued
PIG IRON 1/ AND DIRECT-REDUCED IRON: 2/ WORLD PRODUCTION, BY COUNTRY 3/ 4/

(Thousand metric tons)

Country 5/	1990	1991	1992	1993	1994 e/
Paraguay	61	60	60	60 e/	60
Peru:					
Pig iron	93	207	147	147	147
Direct-reduced iron	29	24	20	20 e/	20
Poland	8,660	6,360	6,350	6,180 r/	6,800 6/
Portugal	339	251	402	398 r/	415
Qatar: Direct-reduced iron e/	530	530	530	530	530
Romania	6,360	4,530 r/	3,110	3,190 r/	3,500 6/
Russia:					
Pig iron	XX	XX	45,800 r/	40,900 r/	36,100
Direct-reduced iron e/ 9/	XX	XX	1,580	1,540 r/	1,710 6/
Saudi Arabia: Direct-reduced iron	1,090	1,120	1,610	2,000	2,110 6/
Serbia and Montenegro	XX	XX	512	500 e/	500
Slovakia e/	XX	XX	XX	3,000	3,000
South Africa, Republic of:					
Pig iron	6,260	6,970	6,500	6,120 r/	6,050 6/
Direct-reduced iron	882	863	854	833 r/	980 6/
Spain	5,540	5,400	5,080	5,450 r/	5,450
Sweden	2,740	2,810	2,740	2,850 r/	3,040 6/
Switzerland	129 r/	105 r/	110 r/	110 r/	110
Taiwan	5,470	5,560	5,290	6,120	5,940
Trinidad and Tobago: Direct-reduced iron	697	710	680	675	912 6/
Tunisia e/	140	140	140	140	140
Turkey	4,830	4,590	4,510	4,350 r/	4,600 6/
Ukraine	XX	XX	34,700 r/	27,000	20,000
U.S.S.R: 10/					
Pig iron	110,000	91,000 r/	XX	XX	XX
Direct-reduced iron e/ 9/	1,600	1,500	XX	XX	XX
United Kingdom	12,300	11,900	11,500 r/	11,500 r/	12,000 6/
United States:					
Pig iron	49,700	44,100	47,400	48,200	49,400
Direct-reduced iron	390	410	390	440	480
Venezuela:					
Pig iron	314	--	--	--	--
Direct-reduced iron	3,130 r/	4,020 r/	4,300	4,510 r/	4,710 6/
Yugoslavia 11/	2,310	1,600 e/	--	--	--
Zimbabwe e/	521	535	507	500	187
Total pig iron	531,000 r/	509,000 r/	503,000 r/	506,000 r/	512,000
Total direct-reduced iron	18,200	19,400	20,900	23,800	28,000
Grand total	549,000 r/	528,000 r/	524,000 r/	530,000 r/	540,000

e/ Estimated. r/ Revised. XX Not applicable.

1/ Production is pig iron unless otherwise specified.

2/ Direct-reduced iron is obtained from ore by reduction of oxides to metal without melting.

3/ Table excludes ferroalloy production except where otherwise noted. Table includes data available though July 12, 1995.

4/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

6/ In addition to the countries listed, Vietnam has facilities to produce pig iron and may have produced limited quantities during 1990-94, but output is not reported and available information is inadequate to make reliable estimates of output levels.

6/ Reported figure.

7/ Dissolved Dec. 31, 1992.

8/ Includes blast furnace ferroalloys.

9/ All production in the U.S.S.R. for 1990-91 came from Russia.

10/ Dissolved in Dec. 1991.

11/ Dissolved in Apr. 1992.

TABLE 12
GOVERNMENT INVENTORY OF FERROALLOYS, DECEMBER 31, 1994 1/

(Metric tons of alloy, unless otherwise stated)

Alloy	Stockpile grade	Nonstockpile grade	Total
Ferrochromium:			
High-carbon	740,000	629	740,000
Low-carbon	272,000	10,400	283,000
Ferrochromium-silicon	51,700	1,240	52,900
Ferrocolumbium (kilograms contained columbium)	385,000 2/	151,000	535,000
Ferromanganese:			
High-carbon	982,000	--	982,000
Medium-carbon	19,700	--	19,700
Ferrotungsten (kilograms contained tungsten)	385,000	533,000	918,000
Silicomanganese	183	--	183

1/ Data rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.
2/ Includes 113,000 kg of material on hand but not yet applied to stockpile.

TABLE 13
U.S. FERROALLOY PRODUCTION 1/ AND SHIPMENTS 2/ 3/

(Metric tons, gross weight, unless otherwise specified)

	1994			
	Net production	Net shipments		Stocks, December 31
		Quantity	Value (thousand)	
Ferrophosphorus	W	51,500	5,880	11,200
Ferrosilicon 4/	359,000	343,000	196,000	68,900
Silicon metal	158,000	163,000	226,000	6,360
Other 5/	267,000	223,000	245,000	35,700
Total	784,000	780,000	672,000	122,000

W Withheld to avoid disclosing company proprietary data; included with "Other."
1/ Does not include alloys produced for consumption in the making of other ferroalloys.
2/ Gross sales (including exports) minus purchases.
3/ Data rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.
4/ Includes all regular and specialty grades of ferrosilicon, excluding silvery pig iron.
5/ Includes ferroaluminum, ferroboron, and other complex boron additive alloys, all chromium-containing ferroalloys and chromium metal, all manganese-containing ferroalloys and manganese metal, ferromolybdenum, ferronickel, ferrotitanium, ferrovanadium, silvery pig iron, and data indicated by the symbol "W."

TABLE 14
REPORTED U.S. CONSUMPTION OF FERROALLOYS AS ADDITIVES IN 1994, BY END USE 1/ 2/

(Metric tons of alloys unless otherwise specified)

End use	FeMn	SiMn	FeSi	FeTi	FeP	FeB
Steel:						
Carbon	277,000	83,100	60,500 3/	2,390	4,680	767
Stainless and heat-resisting	14,700 3/	4,460	65,800 3/	1,930	--	29
Other alloy	46,700 3/	24,600	52,000 3/	409	1,010	397
Tool	(4/)	(4/)	2,490 3/	(5/)	--	--
Unspecified	1,210	425	15,300	--	(5/)	(5/)
Total steel	340,000	113,000	196,000	4,720	5,690	1,190
Cast irons	10,900	605	182,000	96	1,340	(6/)
Superalloys	122 7/	--	18 8/	609	--	(6/)
Alloys (excluding alloy steels and superalloys)	21,200	(9/)	W	659	W	136
Miscellaneous and unspecified	(6/)	(9/)	207,000	(6/)	90	(6/)
Grand total	372,000	113,000	586,000	6,090	7,110	1,330
Total 1993	365,000 r/	111,000 r/	590,000 r/	5,920 r/	7,970	1,160 r/
Percent of 1993	102	102	99	103	89	115
Consumer stocks, December 31	40,100 10/	7,000 10/	20,000	575	1,150	245

r/ Revised. W Withheld to avoid disclosing company proprietary data; included with "Miscellaneous and unspecified."
1/ Data rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.
2/ FeMn, ferromanganese, including spiegeleisen and manganese metal; SiMn, silicomanganese; FeSi, ferrosilicon, including silicon metal, silvery pig iron, and inoculant alloys; FeTi, ferrotitanium, including other titanium materials; FeP, ferrophosphorus, including other phosphorus materials; FeB, ferroboron including other boron materials.
3/ Part included with "Steel: Unspecified."
4/ Included with "Steel: Unspecified."
5/ Included with "Steel: Other alloy."
6/ Included with "Alloys (excluding alloy steels and superalloys)."
7/ Part included with "Alloys (excluding alloy steels and superalloys)."
8/ Part included with "Miscellaneous and unspecified."
9/ Withheld to avoid disclosing company proprietary data.
10/ Includes producer stocks.

TABLE 15
REPORTED U.S. CONSUMPTION OF FERROALLOYS AS ALLOYING ELEMENTS IN 1994, BY END USE 1/ 2/

(Metric tons of contained elements unless otherwise specified)

End use	FeCr	FeMo	FeW	FeV	FeCb	FeNi
Steel:						
Carbon	11,700	1,050	--	1,680	920	--
Stainless and heat-resisting	275,000 3/	3,890	35	26	350	17,600
Other alloy	38,700 3/	4,500	19	1,760	1,050	--
Tool	2,980	788	529	424	(4/)	--
Unspecified	609	--	--	11	9	--
Total steel	329,000	10,200	583	3,900	2,330	17,600
Cast irons	4,950	986	--	31	--	--
Superalloys	9,450 5/	618	300	16	411	--
Alloys (excluding alloy steels and superalloys)	2,560	169	5,920	326	W	--
Miscellaneous and unspecified 6/	2,980	7,090	1,310	23	9	1,290
Grand total	349,000	19,100	8,110	4,290	2,750	18,900
Total 1993	361,000 r/	17,700 r/	7,580	3,970	2,470 r/	105,000 r/
Percent of 1993	97	108	107	108	111	18
Consumer stocks, December 31	14,900 7/	2,080	849	473	NA	7,210 8/

r/ Revised. NA Not available. W Withheld to avoid disclosing company proprietary data; included with "Miscellaneous and unspecified."
1/ Data rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.
2/ FeCr, ferrochromium, including other chromium ferroalloys and chromium metal; FeMo, ferromolybdenum, including calcium molybdate; FeW, ferrotungsten, including scheelite; FeV, ferrovanadium, including other vanadium-carbon-iron ferroalloys; FeCb, ferrocolumbium, including nickel columbium; FeNi, ferronickel.
3/ Part included with "Steel: Unspecified."
4/ Included with "Steel: Unspecified."
5/ Part included with "Alloys (excluding alloy steels and superalloys)."
6/ Includes mill products made from metal powder, pigments, catalyts and other chemicals or ceramic uses.
7/ Includes some producer stocks.
8/ Secondary stocks not yet available.

TABLE 16
FERROALLOY PRICES IN 1994

	High	Low	Average 1/
Standard-grade ferromanganese 2/	500.00	470.00	482.66
Medium-carbon ferromanganese 3/	49.00	45.00	46.98
Silicomanganese 4/	26.50	24.00	25.11
Charge-grade ferrochromium 3/	45.00	35.50	36.84
High-carbon ferrochromium 3/	48.50	34.75	36.92
Low-carbon ferrochromium 3/	90.00	70.00	83.00
50%-grade ferrosilicon 3/	45.00	42.50	43.94
75%-grade ferrosilicon 3/	45.00	35.70	40.78
Silicon metal 4/	67.00	59.00	64.06
Ferromolybdenum 5/	15.00	3.35	5.11
Molybdenum oxide 5/	17.00	2.68	4.60
Ferrovanadium 6/	18.50	7.80	9.08

1/ Annual weighted average.
2/ Dollars per long ton.
3/ Cents per pound of contained element.
4/ Cents per pound.
5/ Dollars per pound of contained element.
6/ Dollars per kilogram of contained element.

Source: Platt's Metals Week.

TABLE 17
U.S. IMPORTS FOR CONSUMPTION AND EXPORTS OF FERROALLOYS AND FERROALLOY METALS IN 1994 1/

(Metric tons)

	Imports			Exports		
	Gross weight	Contained weight	Value (thousands)	Gross weight	Contained weight	Value (thousands)
Ferroalloys:						
Chromium ferroalloys:						
Ferrochromium containing:						
More than 4% of carbon	248,000	147,000	$94,000	6,220	3,700	$525
More than 3% but not more than 4% of carbon	4,830	2,820	1,770	XX	XX	XX
Not more than 3% of carbon	64,500	42,500	52,000	5,320	3,280	6,450
Ferrochromium-silicon	15,100	526	7,790	499	174	554
Total chromium ferroalloys	333,000	193,000	156,000	12,000	7,150	7,530
Manganese ferroalloys:						
Ferromanganese containing:						
More than 4% of carbon	249,000	194,000	99,900	XX	XX	XX
More than 2% of carbon	XX	XX	XX	4,280	(2/)	2,700
More than 1% but not more than 2% of carbon	74,400	59,900	53,500	XX	XX	XX
Not more than 1% of carbon	12,200	10,800	15,400	XX	XX	XX
Ferromanganese, other	XX	XX	XX	6,700	(2/)	6,770
Silicomanganese	273,000	181,000	123,000	6,840	(2/)	5,490
Total manganese ferroalloys	609,000	445,000	292,000	17,800	XX	15,000
Silicon ferroalloys:						
Ferrosilicon containing:						
More than 55% of silicon	XX	XX	XX	7,940	4,790	7,430
More than 55% but not more than 80% of silicon and more than 3% of calcium	2,190	1,610	1,550	XX	XX	XX
More than 55% but not more than 80% of silicon and not more than 3% of calcium	180,000	136,000	111,000	XX	XX	XX
Magnesium ferrosilicon	6,740	3,060	6,670	XX	XX	XX
Ferrosilicon, other	15,700	5,900	5,760	30,000	15,000	28,900
Total silicon ferroalloys	204,000	147,000	125,000	38,000	19,800	36,300
Other ferroalloys:						
Ferrocerium and other pyrophoric alloys	170	(2/)	1,420	XX	XX	XX
Ferromolybdenum	4,590	2,960	2,260	795	479	5,200
Ferronickel	42,400	15,300	85,500	60	35	97
Ferroniobium (columbium)	3,980	(2/)	34,000	234	(2/)	2,080
Ferrophosphorus	15,200	(2/)	5,170	29,100	(2/)	4,960
Ferrotitanium and ferrosilicon-titanium	6,340	(2/)	11,200	XX	XX	XX
Ferrotungsten and ferrosilicon-tungsten	669	515	1,890	39	19	71
Ferrovanadium	3,190	1,910	12,900	498	374	4,410
Ferrozirconium	60	(2/)	108	131	(2/)	160
Ferroalloys, other	22,400	(2/)	30,600	3,280	(2/)	4,520
Total other ferroalloys	99,000	XX	185,000	34,200	XX	21,500
Total ferroalloys	1,240,000	XX	758,000	102,000	XX	80,300
Metals:						
Chromium	6,520	(2/)	39,300	446	(2/)	4,150
Manganese:						
Unwrought	16,600	(2/)	23,000	16,600	(2/)	23,000
Other	3,630	(2/)	5,760	3,630	(2/)	5,760
Silicon:						
Less than 99% of silicon	62,400	70,600	59,900	9,240	8,970	12,600
Less than 99.99% but not less than 99% of silicon	36,900	36,400	47,500	796	773	1,110
Not less than 99.99% of silicon	1,120	1,120	44,500	2,080	2,080	127,000
Total ferroalloy metals	127,000	XX	220,000	32,800	XX	173,000
Grand total	1,370,000	XX	978,000	135,000	XX	254,000

XX Not applicable.

1/ Data rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.

2/ Not recorded.

Source: Bureau of the Census.

TABLE 18
FERROALLOYS: WORLD PRODUCTION, BY COUNTRY, FURNACE TYPE, AND ALLOY TYPE 1/ 2/

(Metric tons)

Country, furnace type, 3/ and alloy type 4/	1990	1991	1992	1993	1994 e/
Albania: Electric furnace, ferrochromium e/	24,000 5/	25,000 e/	22,000 r/	36,000 r/	34,000
Argentina: Electric furnace:					
Ferromanganese	24,300	26,300	4,520	5,400 r/ e/	4,500
Silicomanganese	21,800	14,600	30,800	18,500 r/ e/	20,000
Ferrosilicon	23,600	14,400	8,070 r/	10,000 r/ e/	10,000
Silicon metal	5,930 r/	5,030 r/	3,400 r/	3,500 r/ e/	3,500
Other	380 r/	375 r/	197 r/	200 r/ e/	200
Total	76,100 r/	60,700 r/	47,000 r/	37,600 r/ e/	38,200
Australia: Electric furnace: e/					
Ferromanganese	70,000	45,000	55,000	75,000	100,000
Silicomanganese	65,000	74,000	75,000	75,000	100,000
Ferrosilicon	20,000	19,000	17,000 r/	--	--
Silicon metal	33,000	30,000	30,000	30,000	30,000
Total	188,000	168,000	177,000 r/	180,000 r/	230,000
Austria: Electric furnace: e/					
Ferronickel	8,100	8,600	6,100	6,100	6,100
Other	3,900	3,400	5,900	5,900	5,900
Total	12,000 5/	12,000	12,000	12,000	12,000
Belgium: Electric furnace, ferromanganese e/	25,000	25,000	25,000	25,000	25,000
Bosnia and Herzegovina: Electric furnace:					
Ferrosilicon	XX	XX	5,000	1,000 e/	1,000
Silicon metal	XX	XX	2,000	200 e/	200
Other	XX	XX	500	--	--
Total	XX	XX	7,500	1,200 e/	1,200
Brazil: Electric furnace:					
Ferromanganese	171,000	169,000	179,000	202,000 r/	180,000
Silicomanganese	217,000	272,000	300,000	284,000 r/	270,000
Ferrosilicon	229,000	191,000	244,000	240,000 e/	240,000
Silicon metal	132,000	106,000	93,700	95,000 e/	100,000
Ferrochromium	83,800	82,200	91,100 r/	83,900 r/	77,100
Ferrochromiumsilicon	4,970	4,520	4,500 e/	4,500 e/	5,000
Ferronickel	34,300	34,100	34,000 e/	34,000 e/	34,000
Other	68,000	76,500	76,700	76,000 r/ e/	76,000
Total	939,000	935,000	1,020,000 e/	1,020,000 r/ e/	982,000
Bulgaria: Electric furnace: e/					
Ferrosilicon	16,200	25,200	18,000	18,000	18,000
Other	1,800	2,800	2,000	2,000	2,000
Total	18,000	28,000	20,000	20,000	20,000
Canada: Electric furnace: e/					
Ferromanganese 6/	185,000 5/	45,000	--	--	--
Ferrosilicon	95,000 r/	75,000 r/	55,000	55,000	55,000
Silicon metal	20,000 r/	20,000 r/	20,000	20,000	20,000
Ferrovanadium	2,000 r/	2,000 r/	2,000	2,000	2,000
Total	302,000 r/	142,000 r/	77,000	77,000	77,000
Chile: Electric furnace:					
Ferromanganese	3,590	6,780	7,460	8,920 r/	8,500
Silicomanganese	985	1,670	1,560	1,610 r/	1,610
Ferrosilicon	4,660	5,520	5,600 e/	5,700 e/	5,600
Ferrochromium	1,870	2,510	2,100	680 r/	1,580
Ferromolybdenum	2,280	2,670	2,310 r/	2,300 r/	2,300
Total	13,400	19,200 e/	19,000 r/ e/	19,200 r/ e/	19,600
China: e/					
Blast furnace:					
Ferromanganese	330,000	500,000	550,000	520,000 r/	510,000
Other	170,000	170,000	180,000	200,000	210,000
Electric furnace:					
Ferromanganese	150,000	180,000	200,000	220,000	250,000
Silicomanganese	370,000	415,000	420,000	525,000 r/	550,000
Ferrosilicon	727,000	817,000	834,000	1,040,000 r/	1,100,000
Ferrochromium	340,000 r/	380,000 r/	410,000 r/	372,000 r/	370,000
Other	313,000 r/	88,000	56,000 r/	58,000 r/	110,000
Total	2,400,000	2,550,000	2,650,000	2,930,000 r/	3,100,000
Colombia: Electric furnace, ferronickel	43,800	49,800	49,800	44,000 r/	50,800

See footnotes at end of table.

TABLE 18--Continued
FERROALLOYS: WORLD PRODUCTION, BY COUNTRY, FURNACE TYPE, AND ALLOY TYPE 1/ 2/

(Metric tons)

Country, furnace type, 3/ and alloy type 4/	1990	1991	1992	1993	1994 e/
Croatia: Electric furnace:					
Ferrochromium	XX	XX	56,500	27,300	32,000 5/
Ferromanganese e/	XX	XX	10,000	10,000	10,000
Silicomanganese e/	XX	XX	40,000	40,000	40,000
Total e/	XX	XX	106,000	77,300	82,000
Czech Republic: Electric furnace, total e/	XX	XX	XX	1,000	1,000
Czechoslovakia: Electric furnace:					
Ferromanganese e/ 6/	102,000	90,000	70,000	XX	XX
Ferrosilicon	20,500	15,000 e/	15,000 e/	XX	XX
Silicon metal e/	5,000	5,000	5,000	XX	XX
Ferrochromium	37,500 r/	41,200 r/	52,500 r/	XX	XX
Other e/ 7/	10,000	10,000	10,000	XX	XX
Total e/	175,000 r/	161,000 r/	153,000 r/	XX	XX
Dominican Republic: Electric furnace, ferronickel	71,800	72,700	68,800	62,900 r/	80,900
Egypt: Electric furnace:					
Ferrosilicon	7,920	20,000 r/ e/	36,000 r/	40,100 r/	40,000
Ferromanganese	--	10,000 r/ e/	10,000 r/	30,000 r/	35,000
Total	7,920	30,000 r/ e/	46,000 r/	70,100 r/	75,000
Finland: Electric furnace, ferrochromium	157,000	190,000	187,000	218,000	229,000 5/
France:					
Blast furnace, ferromanganese e/	315,000 r/ 5/	290,000 r/	280,000 r/	250,000	300,000
Electric furnace:					
Ferromanganese e/	36,000 5/	30,000	60,000	57,000 r/	60,000
Silicomanganese 8/	61,900	30,000 e/	80,000	80,000 e/	75,000
Ferrosilicon	117,000	106,000	98,000	39,000 r/	40,000
Silicon metal e/	64,000	64,000	60,000	59,000 r/	60,000
Ferrochromium e/	25,000	23,100	6,690	--	--
Other e/ 9/	70,000	50,000	36,000	29,000 r/	30,000
Total e/	689,000 r/	593,000 r/	621,000 r/	514,000 r/	565,000
Georgia: Electric furnace: e/					
Ferromanganese	XX	XX	100,000	100,000	50,000
Silicomanganese	XX	XX	50,000	50,000	25,000
Other	XX	XX	10,000	10,000	5,000
Total	XX	XX	160,000	160,000	80,000
Germany: e/					
Blast furnace, Western states: Ferromanganese	250,000	220,000	130,000	100,000	--
Electric furnace:					
Ferromanganese: 6/					
Eastern states	65,300 5/	XX	XX	XX	XX
Western states	38,000	XX	XX	XX	XX
Total	103,000	40,000	30,000	20,000	20,000
Ferrosilicon:					
Eastern states	24,000	XX	XX	XX	XX
Western states	46,000	XX	XX	XX	XX
Total	70,000	50,000	20,000	20,000	20,000
Silicon metal, Eastern states	3,000	2,600	500	500	500
Ferrochromium:					
Eastern states	21,000	XX	XX	XX	XX
Western states	37,500	XX	XX	XX	XX
Total	58,500	38,300 r/	26,500 5/	16,400 5/	17,000
Other: 7/					
Eastern states	12,000	XX	XX	XX	XX
Western states	54,000	XX	XX	XX	XX
Total	66,000	40,000	30,000	30,000	30,000
Grand total	551,000	391,000 r/	237,000	187,000	87,500
Greece: Electric furnace:					
Ferrochromium	30,300	10,500 e/	--	--	--
Ferronickel	60,500	64,000	65,000	45,000 e/	60,000
Total	90,800	74,500 e/	65,000	45,000 e/	60,000

See footnotes at end of table.

TABLE 18--Continued
FERROALLOYS: WORLD PRODUCTION, BY COUNTRY, FURNACE TYPE, AND ALLOY TYPE 1/ 2/

(Metric tons)

Country, furnace type, 3/ and alloy type 4/	1990	1991	1992	1993	1994 e/
Hungary: 10/ Electric furnace: e/					
Ferrosilicon	9,000	7,000	7,000	7,000	7,000
Silicon metal	2,000	1,000	1,000	1,000	1,000
Other	1,000	1,000	1,000	1,000	1,000
Total	12,000	9,000	9,000	9,000	9,000
Iceland: Electric furnace, ferrosilicon	62,800	50,300	51,700	67,400 r/	66,000 5/
India: Electric furnace:					
Ferromanganese	201,000	211,000 e/	198,000 e/	137,000 r/	150,000
Silicomanganese	57,400	70,000 e/	93,000 e/	85,000 r/	90,000
Ferrosilicon	91,600 r/	85,300 r/	90,000 r/	67,600 r/	85,000
Ferrochromium e/	169,000 r/	229,000 r/	257,000 r/	235,000 r/	251,000
Ferrochromiumsilicon	7,000	8,800	9,000 e/	8,000 e/	8,000
Other e/	400	6,770 5/	6,500	8,600 r/	8,500
Total e/	526,000 r/	611,000 r/	653,000 r/	541,000 r/	593,000
Indonesia: Electric furnace: e/					
Ferronickel	25,000 5/	25,000	26,000	27,000 r/	27,000
Ferromanganese	--	--	--	10,000	10,000
Total	25,000 5/	25,000	26,000	37,000 r/	37,000
Iran: Electric furnace, ferrochromium e/	--	--	--	--	5,000
Italy: Electric furnace:					
Ferromanganese	41,800	14,100	17,100 r/	17,000 r/ e/	16,000
Silicomanganese e/	56,000	55,000	50,000	50,000	40,000
Ferrosilicon	39,800	12,600	3,350 r/	-- r/	--
Silicon metal	13,000 e/	16,200	10,000	10,000 e/	--
Ferrochromium	53,000	47,200	60,300	53,500	22,700
Other e/ 11/	14,500	14,500	12,000	12,000	12,000
Total e/	218,000	160,000	153,000 r/	143,000 r/	90,700
Japan: Electric furnace:					
Ferromanganese	452,000	464,000	362,000	383,000	340,000 5/
Silicomanganese	77,500	87,200	96,400	64,800	68,900 5/
Ferrosilicon	62,600	62,400	37,700	29,100 r/	13,100 5/
Ferrochromium 12/	293,000	271,000	268,000	205,000 r/	192,000 5/
Ferronickel	234,000	295,000	237,000	257,000 r/	242,000 5/
Other 13/	12,100	12,300	12,200	13,700 r/	14,600 5/
Total	1,130,000	1,190,000	1,010,000	952,000 r/	871,000 5/
Kazakhstan: Electric furnace: e/					
Ferrosilicon	XX	XX	500,000	450,000	350,000
Ferrochromium	XX	XX	400,000	328,000 r/ 5/	185,000
Ferrochromiumsilicon	XX	XX	40,000	40,000	20,000
Other	XX	XX	20,000	20,000	15,000
Total	XX	XX	960,000	838,000 r/	570,000
Korea, North: Electric furnace: e/					
Ferromanganese 6/	70,000	70,000	70,000	70,000	70,000
Ferrosilicon	30,000	30,000	30,000	30,000	30,000
Other 7/	20,000	20,000	20,000	20,000	20,000
Total	120,000	120,000	120,000	120,000	120,000
Korea, Republic of: Electric furnace:					
Ferromanganese	84,000	94,900	85,900	101,000 r/	120,000 5/
Silicomanganese	82,800	74,200	82,600	82,000 r/	89,000 5/
Ferrosilicon	2,000	--	55	--	--
Total	169,000	169,000	169,000	183,000	209,000 5/
Macedonia: 14/ Electric furnace: e/					
Ferrochromium	XX	XX	3,960 5/	4,380 5/	3,160 5/
Ferrochromiumsilicon	XX	XX	1,500	--	--
Ferrosilicon	XX	XX	30,000	20,000	20,000
Silicon metal	XX	XX	1,000	1,000	1,000
Total	XX	XX	36,500	25,400	24,200
Mexico: Electric furnace:					
Ferromanganese	123,000	98,000	79,000	70,000 e/	67,000 5/
Silicomanganese	65,000	51,000	51,000	55,000 e/	64,000 5/
Ferrosilicon	7,000	6,000	5,000	400 e/	400
Ferrochromium	275	72	70 e/	-- r/	--
Other	250	105	300	300 e/	300
Total	196,000	155,000	135,000 e/	126,000 e/	132,000

See footnotes at end of table.

TABLE 18--Continued
FERROALLOYS: WORLD PRODUCTION, BY COUNTRY, FURNACE TYPE, AND ALLOY TYPE 1/ 2/

(Metric tons)

Country, furnace type, 3/ and alloy type 4/	1990	1991	1992	1993	1994 e/
New Caledonia: Electric furnace, ferronickel	127,000	138,000	126,000	146,000 e/	156,000
Norway: Electric furnace:					
Ferromanganese	213,000	173,000	203,000	226,000 r/	249,000 5/
Silicomanganese	223,000	227,000	213,000	219,000 r/	197,000 5/
Ferrosilicon	398,000	377,000	367,000	400,000 r/	453,000 5/
Silicon metal e/	76,600 5/	65,000	60,000	60,000	60,000
Ferrochromium	60,000	83,000	102,000	80,000	120,000
Other e/ 8/	14,000	14,000	14,000	14,000	14,000
Total e/	985,000	939,000	959,000	998,000 r/	1,090,000
Peru: Electric furnace: e/					
Ferromanganese	1,330 r/	331 r/	-- r/	-- r/	--
Ferrosilicon	500	600	600	600	600
Total	1,830 r/	931 r/	600 r/	600 r/	600
Philippines: Electric furnace:					
Ferromanganese e/	--	5,000	5,000	5,000	5,000
Ferrosilicon e/	10,000	10,000	10,000	10,000	10,000
Ferrochromium	55,700 r/	23,700	27,400	11,900 r/	16,200
Total e/	65,700 r/	38,700	42,400	26,900 r/	31,200
Poland:					
Blast furnace:					
Spiegeleisen e/	140 5/	140	140	130	130
Ferromanganese	71,000	57,400	43,000 r/ e/	56,000 r/ e/	55,000
Electric furnace:					
Ferromanganese e/	5,400 5/	5,000	5,000	5,000	5,000
Silicomanganese e/	25,000	25,000	25,000	25,000	25,000
Ferrosilicon e/	88,600 5/	80,000	75,000	70,000	70,000
Silicon metal e/	10,000	9,000 5/	9,000	9,000	9,000
Ferrochromium	13,700	1,930	35,300 r/	38,400 r/	7,000
Other 7/	33,100	30,000	25,000 e/	20,000 e/	20,000
Total e/	247,000	208,000	217,000 r/	224,000 r/	191,000
Portugal: Electric furnace, ferromanganese e/	12,500	--	--	--	--
Romania: Electric furnace: e/					
Ferromanganese	60,000	40,000	27,100 5/	27,000	31,300 5/
Silicomanganese	30,000	30,000	28,200 5/	28,000	35,800 5/
Ferrosilicon	40,000	30,000	23,300 5/	21,000	27,900 5/
Silicon metal	4,000	1,000	430 5/	400	400
Ferrochromium	20,600	20,400	6,980 5/	3,910 5/	3,900
Total	155,000	121,000	86,000 5/	80,300	99,300
Russia: e/					
Blast furnace:					
Spiegeleisen	XX	XX	10,000	8,000	7,000
Ferromanganese	XX	XX	200,000	150,000	125,000
Ferrophosphorus	XX	XX	30,000	25,000	20,000
Electric furnace:					
Ferrosilicon	XX	XX	500,000	500,000	450,000
Silicon metal	XX	XX	60,000	60,000	50,000
Ferrochromium	XX	XX	400,000	256,000 r/ 5/	266,000 5/
Ferrochromiumsilicon	XX	XX	60,000	60,000	40,000
Ferronickel	XX	XX	65,000	50,000	45,000
Other	XX	XX	60,000	50,000	40,000
Total	XX	XX	1,390,000	1,160,000 r/	1,040,000
Serbia and Montenegro: Electric furnace:					
Ferronickel	XX	XX	6,480 r/	6,500 r/ e/	6,000
Slovakia: Electric furnace:					
Ferromanganese	XX	XX	XX	22,000 r/ e/	25,000
Silicomanganese	XX	XX	XX	12,000	12,000
Ferrochromium 15/	XX	XX	XX	50,600 r/	48,500
Other	XX	XX	XX	8,000 e/	8,000
Total	XX	XX	XX	92,600 r/ e/	93,500

See footnotes at end of table.

TABLE 18--Continued
FERROALLOYS: WORLD PRODUCTION, BY COUNTRY, FURNACE TYPE, AND ALLOY TYPE 1/ 2/

(Metric tons)

Country, furnace type, 3/ and alloy type 4/	1990	1991	1992	1993	1994 e/
Slovenia: Electric furnace: e/					
Ferrochromium	XX	XX	17,100 5/	9,000 5/	12,600 5/
Ferrosilicon	XX	XX	14,000	12,000	12,000
Calciumsilicon	XX	XX	400	200	200
Other	XX	XX	5,000	--	--
Total	XX	XX	36,500	21,200	24,800
South Africa, Republic of: Electric furnace:					
Ferromanganese	404,000	260,000 r/	270,000	393,000	568,000 5/
Silicomanganese	269,000 r/	270,000 r/	267,000 r/	268,000 r/	279,000 5/
Ferrosilicon	78,200 r/	68,300	63,900 r/	98,800 r/	94,500 5/
Silicon metal	35,700 r/	39,800	34,500	38,300	36,200 5/
Ferrochromium 16/	1,020,000	1,150,000 r/	771,000 r/	834,000 r/	1,100,000 5/
Other e/	1,000	1,000	1,000	1,000	1,000
Total e/	1,810,000 r/	1,790,000 r/	1,410,000 r/	1,630,000 r/	2,080,000
Spain: Electric furnace: e/					
Ferromanganese	52,200	50,000	50,000	40,000 r/	35,000
Silicomanganese	38,400	40,000	40,000	35,000 r/	35,000
Ferrosilicon	37,500	40,000	40,000	30,000 r/	25,000
Silicon metal	9,000	9,000	10,000	5,000 r/	3,000
Ferrochromium	15,000	6,000	--	2,390 5/	2,000
Other	5,000	5,000	5,000	5,000	4,000
Total	157,000	150,000	145,000	117,000 r/	104,000
Sweden: Electric furnace:					
Ferrosilicon	18,700	21,100	15,500 r/	20,400 r/	20,000
Silicon metal	-- r/	--	--	--	--
Ferrochromium	118,000	121,000	133,000 r/	128,000	134,000 5/
Total	136,000 r/	142,000	149,000 r/	148,000 r/	154,000
Switzerland: Electric furnace: e/					
Ferrosilicon	3,000	3,000	3,000	3,000	3,000
Silicon metal	2,000	2,000	2,000	2,000	2,000
Total	5,000	5,000	5,000	5,000	5,000
Taiwan: Electric furnace:					
Ferromanganese	43,600	40,100	37,800	13,600	7,000
Silicomanganese	20,600	12,800	3,990	--	--
Ferrosilicon	15,500	6,250	2,610	689	500
Total	79,700	59,200	44,400	14,300	7,500
Thailand: Electric furnace:					
Ferromanganese	--	1,550	549	70	100
Silicomanganese	4,510	3,940	4,280	1,500	1,500
Total	4,510	5,480	4,820	1,570	1,600
Turkey: Electric furnace:					
Ferrosilicon	5,230	1,740	1,250	4,700 r/	5,000
Ferrochromium	62,000 r/	84,700	85,800	90,000	97,600 5/
Total	67,300 r/	86,400	87,000	94,700 r/	103,000
Ukraine: e/					
Blast furnace:					
Ferromanganese	XX	XX	50,000	40,000 r/	30,000
Spiegeleisen	XX	XX	5,000	4,000	3,000
Electric furnace:					
Ferromanganese	XX	XX	100,000	80,000 r/	60,000
Silicomanganese	XX	XX	1,000,000	700,000	600,000
Ferrosilicon	XX	XX	500,000	500,000	400,000
Ferronickel	XX	XX	50,000 r/	50,000 r/	38,800 5/
Other	XX	XX	40,000	40,000	30,000
Total	XX	XX	1,750,000 r/	1,410,000 r/	1,160,000
U.S.S.R.: 17/					
Blast furnace:					
Spiegeleisen	17,000	15,000 e/	XX	XX	XX
Ferromanganese	281,000	235,000	XX	XX	XX
Ferrophosphorus	30,000	31,000	XX	XX	XX

See footnotes at end of table.

TABLE 18--Continued
FERROALLOYS: WORLD PRODUCTION, BY COUNTRY, FURNACE TYPE, AND ALLOY TYPE 1/ 2/

(Metric tons)

Country, furnace type, 3/ and alloy type 4/	1990	1991	1992	1993	1994 e/
U.S.S.R. 17/--Continued:					
Electric furnace: e/ 18/					
Ferromanganese	410,000	370,000	XX	XX	XX
Silicomanganese	1,300,000	1,100,000	XX	XX	XX
Ferrosilicon	1,860,000	1,600,000	XX	XX	XX
Silicon metal	65,000	60,000	XX	XX	XX
Ferrochromium	700,000	700,000	XX	XX	XX
Ferrochromiumsilicon	100,000	100,000	XX	XX	XX
Ferronickel	85,000	80,000	XX	XX	XX
Other	160,000	140,000	XX	XX	XX
Total e/	5,010,000	4,430,000	XX	XX	XX
United Kingdom:					
Blast furnace, ferromanganese	144,000	178,000	137,000	45,000 r/ e/	--
Electric furnace, other e/	10,000	10,000	10,000	10,000	--
Total e/	154,000	188,000	147,000	55,000 r/ e/	--
United States: Electric furnace:					
Ferromanganese 19/	W	W	W	W	W
Ferrosilicon	434,000	338,000	346,000	323,000	359,000 5/
Silicon metal	141,000	145,000	159,000	159,000	158,000 5/
Ferrochromium 20/	109,000	68,300	60,900	63,000	67,400 5/
Ferronickel	7,330	14,300	18,200	9,930	-- 5/
Other	184,000	211,000	190,000	161,000	200,000 5/
Total	875,000	777,000	773,000	715,000	784,000 5/
Uruguay: Electric furnace, ferrosilicon e/	250	250	250	250	250
Venezuela: Electric furnace: e/					
Ferromanganese	--	1,000	9,000	-- r/	--
Silicomanganese	31,000	31,000	32,000	42,000 r/	40,000 5/
Ferrosilicon	55,000	55,000	56,000	56,000	41,000
Total	86,000	87,000	97,000	98,000 r/	81,000
Yugoslavia: 21/ Electric furnace:					
Ferromanganese	31,800	20,000 e/	XX	XX	XX
Silicomanganese	60,600	50,000 e/	XX	XX	XX
Ferrosilicon	103,000	80,000 e/	XX	XX	XX
Silicon metal	12,700	10,000 e/	XX	XX	XX
Ferrochromium	82,700	91,000 e/	XX	XX	XX
Ferrochromiumsilicon	4,200	3,000 e/	XX	XX	XX
Ferronickel	11,900	7,000 e/	XX	XX	XX
Calciumsilicon	835	1,000 e/	XX	XX	XX
Other	10,500	9,000 e/	XX	XX	XX
Total	318,000	271,000 e/	XX	XX	XX
Zimbabwe: Electric furnace:					
Ferrochromium	222,000	187,000	191,000	130,000 r/	190,000
Ferrochromiumsilicon	16,600	27,800	20,300	10,000 e/	10,000
Ferromanganese	--	--	--	2,150	--
Total	239,000	215,000	211,000	142,000 r/ e/	200,000
Grand total	18,800,000	17,700,000	16,800,000 r/	16,000,000 r/	16,000,000
Of which:					
Blast furnace:					
Spiegeleisen 22/	17,100	15,100	15,100	12,100	10,100
Ferromanganese 22/	1,390,000 r/	1,480,000 r/	1,390,000 r/	1,160,000 r/	1,020,000
Other	200,000	201,000	210,000	225,000	230,000
Total blast furnace	1,610,000 r/	1,700,000 r/	1,620,000 r/	1,400,000 r/	1,260,000
Electric furnace:					
Ferromanganese 23/ 24/	3,080,000	2,590,000 r/	2,270,000 r/	2,350,000	2,500,000
Silicomanganese 23/ 25/	3,080,000 r/	2,930,000 r/	2,980,000	2,740,000 r/	2,660,000
Ferrosilicon	4,780,000 r/	4,300,000 r/	4,130,000 r/	4,190,000 r/	4,070,000
Silicon metal	633,000 r/	591,000 r/	561,000 r/	553,000 r/	535,000
Ferrochromium 26/	3,750,000 r/	3,880,000 r/	3,670,000 r/	3,280,000 r/	3,490,000
Ferrochromiumsilicon	133,000	144,000	135,000	123,000	83,000
Ferronickel	708,000	788,000	753,000 r/	738,000 r/	747,000
Other	1,004,000 r/	752,000 r/	653,000 r/	601,000 r/	653,000
Total electric furnace	17,200,000	16,000,000 r/	15,200,000 r/	14,600,000 r/	14,700,000

See footnotes at end of table.

e/ Estimated. r/ Revised. W Withheld to avoid disclosing company proprietary data; included with "Other." XX Not applicable.
1/ Previously published and 1994 data are rounded by the U.S. Bureau of Mines to three significant digits; may not add to totals shown.
2/ Table includes data available through July 27, 1995.
3/ To the extent possible, ferroalloy production of each country has been separated according to the furnace type from which production is obtained; production derived from metallothermic operations is included with electric furnace production.
4/ To the extent possible, ferroalloy production of each country has been separated so as to show individually the following major types of ferroalloys: spiegeleisen, ferromanganese, silicomanganese, ferrosilicon, silicon metal, ferrochromium, ferrochromium-silicon, and ferronickel. Ferroalloys other than those listed that have been identified specifically in sources, as well as those ferroalloys not identified specifically but which definitely exclude those listed previously in this footnote have been reported as "Other." Where one or more of the individual ferroalloys listed separately in this footnote have been inseparable from other ferroalloys, owing to a nation's reporting system, deviations are indicated by individual footnotes.
5/ Reported figure.
6/ Includes silicomanganese.
7/ Includes ferrochromium-silicon and ferronickel, if any was produced.
8/ Includes silicospiegeleisen.
9/ Includes ferronickel if any was produced.
10/ Hungary is believed to produce some blast furnace ferromanganese.
11/ Series excludes calcium silicide.
12/ Includes ferrochromium-silicon.
13/ Includes calcium-silicon, ferrocolumbium, ferromolybdenum, ferrotungsten, ferrovanadium, and other ferroalloys.
14/ Imports of ferronickel originating in Macedonia were reported in 1992-94, but information on the output of the Kavadarci operation was not available.
15/ May include ferrosilicon-chromium and ferronickel, if any was produced.
16/ Includes production from Bophuthatswana. Includes net production of ferrochromium-silicon, if there was any.
17/ Dissolved in Dec. 1991.
18/ Soviet production of electric furnace ferroalloys is not reported; estimates provided are based on crude source material production and availability for consumption (including estimates) and upon reported ferroalloy trade, including data from trading partner countries.
19/ U.S. output of ferromanganese includes silicomanganese and manganese metal.
20/ U.S. output of ferrochromium includes high- and low-carbon ferrochromium, ferochromium-silicon, chromium metal, and other chromium materials.
21/ Dissolved in Apr. 1992.
22/ Spiegeleisen for the Western states of Germany is included with blast furnace ferromanganese.
23/ Ferromanganese includes silicomanganese (if any was produced) for countries carrying footnote 6 on "Ferromanganese" data line.
24/ U.S. production under "Other."
25/ Includes silicospiegeleisen for France.
26/ Ferrochromium includes ferrochromium-silicon (if any was produced) for Japan, the Republic of South Africa, and the United States.