

IRON AND STEEL SCRAP

By Michael Fenton

Iron and steel scrap is a vital raw material for the production of new steel and cast-iron products. Because of the ready availability of scrap from manufacturing operations and from the recovery of products that are no longer used or needed, the steel and the foundry industries in the United States have been structured to recycle scrap and, as a result, are highly dependent upon it.

The recycling of steel scrap plays an important role in the conservation of energy because remelting of scrap requires much less energy than the production of iron or steel products from iron ore. In addition, the consumption of iron and steel scrap by remelting reduces the burden on landfill disposal facilities and prevents the accumulation of abandoned steel products in the environment.

Environment

Steel mills receiving ferrous scrap were increasingly exposed without warning to radioactive materials at an alarming rate. Of particular concern were radioactive gauges that were discarded or lost by manufacturing operations, medical centers, or the military. These radioactive objects, when shielded by lead, can pass through sensitive radiation detection devices used by electric-arc furnace steel producers. Since 1981, 24 accidental radioactive material meltings have occurred and more than 300 batches of radioactive scrap have been discovered before they were melted. Costs of accidental meltings include as much as \$4 million for plant decontamination, as much as \$15 million for disposing and storing radioactive baghouse dust, and as much as \$13 million in lost sales revenues. Nucor Corp. reported discovery of a shielded source of cesium-137 in scrap at its truck scale, thereby avoiding a cleanup having an estimated cost of between \$3 million and \$21 million (Metal Bulletin Monthly, 1995). In July, the U.S. Nuclear Regulatory Commission (NRC) -State Working Group on Regulation of Radioactive Materials released recommendations concerning the problem (Steel Manufacturers Association, unpublished data accessed June 27, 1997, on the World Wide Web at URL <http://steelnet.org/sma/radscrap.html>). In response, the Steel Manufacturers Association informed members of the House and Senate appropriations subcommittee with jurisdiction over the NRC of the potential health, safety, and economic effects melted radioactive devices can have on the steel industry (Steel Manufacturers Association, unpublished data accessed June 27, 1997, on the World Wide Web at URL <http://www.steelnet.org/sma/enviro.html>). Other radioactive sources are scrap pipe used in oil-drilling operations and scrap from decommissioned nuclear power and U.S. Department of Energy (DOE) facilities.

In September, the DOE adopted a policy that encourages recycling and fabrication of radioactively contaminated carbon steel into one-time-use containers for disposal of low-level wastes (U.S. Department of Energy, unpublished data accessed Aug 11, 1997, on the World Wide Web at URL <http://www.em.doe.gov/recyc/presbref.html>). The United Nations Environment Programme's Basel Convention was established in 1992 to ban the transport of so-called hazardous wastes to poor countries having little ability to deal with them.

The Technical Working Group (TWG) was formed to decide which materials should be classed as hazardous, how to define this, and which should be exempted from the ban. In December 1995, the TWG determined that iron and steel scrap should be exempted from the ban so long as it is not contaminated with materials considered hazardous; this was affirmed in April 1996.

On November 27, the U.S. Environmental Protection Agency proposed to regulate fine particulate matter smaller than 2.5 microns for the first time (Steel Manufacturers Association, 1997). According to the Steel Manufacturers Association, the effect of this would be to force steel companies to install additional expensive control equipment or to reduce production (Steel Manufacturers Association, 1997). Reduced production could result in the elimination of thousands of jobs in the steel industry and force steel consumers to acquire imports from countries that have few or no environmental regulations comparable to those of the United States. The result would be an increase in global pollution and a negative impact on the U.S. trade balance.

Consumption

Domestic data for ferrous scrap were derived from voluntary monthly or annual surveys of U.S. scrap consuming operations by the U.S. Geological Survey. For manufacturers of pig iron and raw steel, about 65% of the known establishments responded to the surveys. Their responses represented about 71% of estimated total scrap consumption by this class of consumers. The remaining 29% of scrap consumption was estimated on the basis of prior reports. For manufacturers of steel castings, iron foundries, and miscellaneous users, about 33% of the surveyed establishments responded to the annual survey, representing about 60% of estimated scrap consumption by these consumers. Total consumption for these two classes of consumers was estimated by using statistical methods and prior reports. Actual survey data accounted for about 62% of total estimated scrap consumption by all classes of scrap consumers.

Brokers, dealers, and other outside sources supplied

domestic consumers with 51 million metric tons of all types of ferrous scrap at an estimated delivered value of nearly \$6.7 billion and exported 8.4 million tons (excluding used rails for rerolling and other uses and ships, boats, and other vessels for scrapping) valued at \$1.3 billion. In 1995, domestic consumers received 50.0 million tons at a delivered value of about \$6.8 billion; exports totaled 10.4 million tons valued at \$1.7 billion. This represented a tonnage increase of about 2% for received quantities and a tonnage decrease of about 19% for exported quantities. The total value of received and exported scrap grades decreased nearly 6% from that of 1995.

Raw steel production was 95.5 million tons in 1996 compared with 95.2 million tons in 1995. The shares of raw steel produced by electric and basic oxygen furnaces were 42% and 58%, respectively, with electric furnace production increasing by 2%. Continuous cast steel production represented 93% of total raw steel production compared with 91% in 1995. Raw steel production capability was 105 million tons compared with 102 million tons in 1995. Raw steel capability utilization was 90.7% compared with 93.3% in 1995.

Steel mills accounted for 80% of all scrap received from brokers, dealers, and other outside sources; iron foundries and miscellaneous users received nearly 15%, and steel foundries received about 4%. The apparent total domestic consumption of ferrous scrap comprised 51 million tons net receipts (total receipts minus shipments) and 20 million tons of home scrap. Stocks of ferrous scrap at consumers' plants increased nearly 24% to 5.2 million tons. Total domestic consumption was 72 million tons, the same as that of 1995. The total market for U.S. produced scrap (net receipts plus exports minus imports) was 56.8 million tons compared with 59.3 million tons (revised) in 1995. Feedstock used by all steel and iron product manufacturers comprised scrap, 94%; pig iron, 4%; and direct reduced iron (DRI), 2%. Consumption of DRI was 16% less than that of 1995.

Net shipments of all grades of steel mill products were 91.2 million tons, an increase of 3.2% over the 88.4 million tons shipped in 1995. Imports of steel mill products increased from 22.1 million tons in 1995 to 26.5 million tons. Exports of steel mill products decreased from 6.4 million tons in 1995 to 4.6 million tons. The U.S. apparent supply of steel mill products increased from 102.3 million tons (revised) in 1995 to 108 million tons. As a share of the U.S. market, imports of steel mill products increased from 21% in 1995 to 25%. Pig iron production decreased from 50.9 million tons in 1995 to 48.5 million tons. As reported by the Bureau of the Census, iron castings shipments, totaled an estimated 9.7 million tons, compared with 9.8 million tons (revised) in 1995. Steel castings shipments (including investment castings) totaled 1.2 million tons, compared with 1.1 million tons (revised) in 1995.

Transportation

Transportation of scrap metal continued to be an important issue to steelmakers and suppliers of raw materials. Increasingly, new minimills with electric furnaces were being

located beyond historical steelmaking areas, resulting in significant changes in movements of scrap and alternate iron sources. Inconsistent railroad freight-car availability was a continuing problem that hampered incoming shipments of scrap and outgoing shipments of finished steel. Railroads increased freight rates dramatically and demanded specific levels of guaranteed business. Some producers resorted to purchase or lease of their own rail cars, trucks, and barges in an attempt to solve the problems of increasing transportation costs and irregular supply of rail cars. Others were considering joining partnerships with other shippers or scrap users to reduce shipping costs.

Prices

The average composite delivered price per metric ton for No. 1 heavy melting steel scrap, calculated from prices per long ton published monthly by American Metal Market, was \$130.66, ranging from a low of \$113.32 in November to a high of \$141.16 in February. The average composite delivered price per metric ton of No. 1 heavy melting steel scrap, calculated from prices per long ton published weekly in Iron Age Scrap Price Bulletin, was \$126.02, ranging from \$106.95 in November to \$134.02 in February. The average composite price published in American Metal Market for No. 1 heavy melting steel scrap was lower than that of 1995 by 3.2%. Prices published in Iron Age Scrap Price Bulletin fell by 4.0%.

Based on weekly quotations by Iron Age Scrap Price Bulletin for 18-8 (18% chromium, 8% nickel) stainless steel scrap (bundles and solids) delivered to consumers in the Pittsburgh, PA, area, the average price decreased 20% from \$1,045 per ton in 1995 to \$831 per ton.

The average value of total ferrous scrap exports (excluding used rails for rerolling and other uses and ships, boats, and other vessels for scrapping) increased 14% to nearly \$163 per ton compared with that of 1995. The average value of total imports increased almost 8% to nearly \$140 per ton.

Foreign Trade

Foreign trade valuation continued to be reported on f.a.s. (free alongside ship) basis for exports and on customs value basis for imports. The U.S. trade surplus for all classes of ferrous scrap (including used rails for rerolling and other uses and ships, boats, and other vessels for scrapping) was \$964,000 and 5.6 million tons (Bureau of the Census, unpub. data, 1996). This represented a decrease of 31% in value and 32% in quantity compared with the 1995 surplus of \$1,393 million and 8.2 million tons.

Total U.S. exports of carbon steel and cast-iron scrap (excluding used rails for rerolling and other uses; ships, boats, and other vessels for scrapping; stainless steel; and alloy steel) went to 61 countries (19% annual decrease) and totaled 7.46 million tons (21% decrease) valued at \$988 million (22% decrease) for an average of \$132 per ton (Bureau of the Census, unpub. data, 1996). The largest tonnages went to the Republic

of Korea, 2.51 million tons; Mexico, 923,000 tons; Canada, 870,000 tons; Turkey, 852,000 tons; Malaysia, 607,000 tons; and India, 409,000 tons. These countries received 83% of the total quantity, valued at \$787 million, which was 80% of the total value.

Total U.S. exports of stainless steel scrap went to 42 countries (the same number as in 1995) and consisted of 303,382 tons (18% decrease) valued at \$234 million (28% decrease) averaging \$770 per ton (13% decrease) (Bureau of the Census, unpub. data, 1996). The largest tonnages went to the Republic of Korea, 79,100 tons; Spain, 64,800 tons; Canada, 54,400 tons; Taiwan, 41,500; and Japan, 25,900 tons. These countries received 88% of the total quantity, valued at \$201 million, which was 86% of the total value.

U.S. exports of alloy steel scrap (excluding stainless steel) in 1996 were shipped to 43 countries (1 less than in 1995) and consisted of 674,000 tons (1% decrease) valued at \$123 million (8% increase) for an average of \$183 per ton (10% increase) (Bureau of the Census, unpub. data, 1996). The largest tonnages went to Canada, 321,000 tons (2% increase) and Mexico, 270,000 tons (26% increase). These countries received 88% of the total quantity, valued at \$79.3 million, which was 64% of the total value.

World Review

Iron and steel scrap is an important raw material for the steel and foundry industries. Because scrap comes from such sources as old buildings, industrial machinery, discarded cars and consumer durables, and manufacturing operations, the mature industrialized economies are the main exporters of scrap. The main trade flows of scrap are from heavily industrialized and developed countries of North America and northern Europe to the lesser developed countries of southern Europe and the Pacific rim. The United States continued to be the leading exporting country of iron and steel scrap in 1996, as reported by the International Iron and Steel Institute (1997). Other major exporters of ferrous scrap were France, Germany, the Netherlands, and the United Kingdom. The most significant importing nations were, in decreasing order of importance, Turkey, Italy, the Republic of Korea, Spain, Belgium-Luxembourg, and the Netherlands. Other Asian importers were China, India, and Japan, which individually imported only about one-fourth of that imported by the Republic of Korea.

Outlook

The demand for steel, both domestically and worldwide, will continue to be the major influence on the ferrous scrap market. Allowing for minor temporary softening of economies, worldwide steel production and consumption are expected to increase over the long term, primarily as a result of economic growth in the developing countries of Asia, Russia and the Commonwealth of Independent States, eastern Europe, and Latin America. As more steel is produced worldwide in electric furnaces and as integrated mills increase usage of scrap in blast

furnaces, demand for scrap supplies will increase. Total electric furnace production may increase as much as 28 million tons per year in China, Indonesia, Malaysia, the Republic of Korea, Taiwan, and Thailand. Growing demand for scrap supplies is also expected in Brazil, India, and Turkey. Domestically, scrap demand will increase in the United States as mills under construction along the Mississippi River are completed, which will cause scrap exports to decrease and imports to increase.

Significant long-term scrap shortages might be expected to develop, as pressure on the scrap market increases. Nevertheless, raw materials demand should be met, either as scrap or as scrap alternatives. In the United States and the emerging industrial countries, the supply of scrap is anticipated to increase as recycling continues to improve. In the United States, for example, the primary feedstock for obsolete grades is the automobile, and virtually every car used is recycled. The recycling rate of obsolete appliance scrap has increased from 2% in 1988 to 75% in 1995 and is expected to increase as environmental regulations increase and recycling becomes more profitable and convenient. The recycling rate of steel cans has increased from 15% in 1988 to 56% in 1995. Nucor-Yamato Steel may be a trend setter as the first facility to recycle nearly all byproducts of steel production, including electric furnace dust, mill scale, and sludge.

Quality is of paramount importance in today's electric steelmaking, which will require higher quality scrap and increasing demand for alternative iron sources. Scrap processors will use more sophisticated sampling, analytical, and computer systems for more careful sorting and optimizing the value of scrap. Cooperation between scrap dealers and consumers will increase in order to provide the best quality scrap requested for specific uses. Increasingly, scrap suppliers are becoming certified in quality-assurance programs. The ISO-9000 and 9002 programs are concerned with product quality, and the ISO-14000 program is designed to avoid environmental damage. Whether or not scrap supply becomes short, interest in alternative iron sources will continue because of the growth of electric furnace steel production and the need to avoid the influence of residual elements on product performance. Production of DRI, increasing steadily during the past three decades, reached a new high in 1996 and may increase an additional 33% by 2000. Basic-grade pig iron from integrated mills has become and perhaps will increasingly be a standard feed in the electric furnaces.

References Cited

- American Metal Market, 1996, Nucor workers find radioactive scrap: American Metal Market, v. 104, no. 53, p. 7.
- International Iron and Steel Institute Monthly Steel Exports-Imports, IISI 153, (Apr. 18, 1997), 2p.

SOURCES OF INFORMATION

U.S. Geological Survey Publications

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Iron and Steel. Ch. in Minerals Commodity Summaries, annual.¹
Iron and Steel Scrap. Mineral Industry Surveys, monthly.¹
Iron and Steel Slag. Ch. in Minerals Commodity Summaries, annual.¹
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Other

American Foundrymen's Society.
American Iron and Steel Institute.
Bureau International De La Recuperation.
Center for Materials Production.
Institute of Scrap Recycling Industries Inc.
Metal Bulletin [London].
Steel Can Recycling Institute.
Steel Manufacturers Association

¹Prior to January 1996, published by the U.S. Bureau of Mines

TABLE 1
SALIENT U.S. IRON AND STEEL SCRAP, PIG IRON, AND DIRECT-REDUCED IRON STATISTICS 1/

(Thousand metric tons unless otherwise specified)

	1992	1993	1994	1995	1996	
Manufacturers of pig iron and raw steel and castings: 2/						
Ferrous scrap consumption	50,000	53,000	54,000	56,000	56,000	
Pig iron consumption	47,000	48,000	50,000	51,000	50,000	
Direct-reduced iron consumption	1,100	1,500	1,500	1,500	1,300	
Net receipts of ferrous scrap 3/	33,000	37,000	40,000	42,000	41,000	
Home scrap production 4/	17,000	16,000	14,000	15,000	15,000	
Ending stocks of ferrous scrap, Dec. 31	3,100	3,200	3,600	3,700	4,800	
Manufacturers of steel castings: 5/						
Ferrous scrap consumption	1,600	1,900	2,000	2,000	2,700	
Pig iron consumption	13	9	10	10	11	
Net receipts of ferrous scrap 3/	1,100	1,300	1,400	1,300	2,000	
Home scrap production 4/	530	610	660	680	640	
Ending stocks of ferrous scrap, Dec. 31	170	86	95	93	95	
Iron foundries and miscellaneous users: 5/						
Ferrous scrap consumption	11,000	13,000	14,000	13,000	13,000	
Pig iron consumption	620	670	1,000	1,100	1,100	
Direct-reduced iron consumption	11	3	2	W	W	
Net receipts of ferrous scrap 3/	8,000	7,900	8,400	8,300	8,300	
Home scrap production 4/	3,300	4,600	5,100	4,900	4,900	
Ending stocks of ferrous scrap, Dec. 31	520	370	370	390	360	
Totals, all manufacturing types:						
Ferrous scrap consumption	63,000	68,000	70,000	72,000	72,000	
Pig iron consumption	48,000	49,000	51,000	52,000	52,000	
Direct-reduced iron consumption	1,100	1,500	1,500	1,500	1,300	
Net receipts of ferrous scrap 3/	42,000	46,000	50,000	51,000	51,000	
Home scrap production 4/	21,000	22,000	20,000	20,000	20,000	
Ending stocks, Dec. 31:						
Ferrous scrap at consumer plants	3,800	3,700	4,100	4,200	5,200	
Pig iron at consumer and supplier plants	180	220	400	620 r/	600	
Direct-reduced iron at consumer plants	130	200	240	190 r/	270	
Exports: 6/						
Ferrous scrap (includes tinplate and terneplate) 7/	9,260	9,810	8,810	10,400	8,440	
Value	thousands	\$1,100,000	\$1,320,000	\$1,270,000	\$1,700,000	\$1,340,000
Pig iron (all grades)	33	27	56	54	48	
Value	thousands	\$3,200	\$3,040	\$6,780	\$6,450	\$7,040
Direct-reduced iron (steelmaking grade)	9	17	17	5	3	
Value	thousands	\$2,020	\$1,860	\$1,850	\$490	\$304
Imports for consumption: 6/						
Ferrous scrap (includes tinplate and terneplate) 7/	1,320	1,390	1,740	2,090	2,600	
Value	thousands	\$148,000	\$162,000	\$218,000	\$284,000	\$342,000
Pig iron (all grades)	497	828	2,500	2,360	2,520	
Value	thousands	\$72,800	\$117,000	\$344,000	\$391,000	\$390,000
Direct-reduced iron (steelmaking grade)	542	1,090	1,170	1,190	1,050	
Value	thousands	\$54,000	\$104,000	\$138,000	\$145,000	\$136,000

r/ Revised. W Withheld to avoid disclosing company proprietary data.

1/ Data are rounded to two significant digits, except trade data which are rounded to three significant digits; may not add to totals shown. Data are not entirely comparable due to changes in collection and estimation methods in 1993.

2/ Includes manufacturers of raw steel that also produce steel castings.

3/ Net receipts of scrap is defined as receipts from brokers, dealers, and other outside sources, plus receipts from other own-company plants, minus shipments.

4/ Home scrap production includes recirculating scrap resulting from current operations and obsolete home scrap.

5/ Some consumers in the "Manufacturers of steel castings" category also produce iron castings; some consumers in the "Iron foundries and miscellaneous users" category also produce steel castings.

6/ Data from Bureau of the Census. Export valuation is "free alongside ship" (f.a.s.) value, and import valuation is customs value.

7/ Excludes used rails for rerolling and other uses, and ships, boats and other vessels for scrapping.

TABLE 2
U.S. CONSUMER RECEIPTS, PRODUCTION, CONSUMPTION, SHIPMENTS, AND STOCKS
OF IRON AND STEEL SCRAP IN 1996, 1/ BY GRADE

(Thousand metric tons)

Grade	Receipts of scrap		Production of home scrap		Consumption of both purchased and home scrap	Shipments of scrap	Ending stocks, Dec. 31
	From brokers, dealers and other outside sources	From other own-company plants	Recirculating scrap from current operations	Obsolete scrap 2/			
Manufacturers of pig iron and raw steel and castings:							
Carbon steel:							
Low-phosphorus plate and punchings	420	--	1	--	380	41	18
Cut structural and plate	3,500	21	760	51	4,200	49	350
No. 1 heavy melting steel	6,600	270	3,900	110	11,000	130	750
No. 2 heavy melting steel	5,000	54	660	10	5,700	5	460
No. 1 and electric furnace bundles	5,700	390	1,600	(3/)	6,900	840	480
No. 2 and all other bundles	1,100	14	2	--	1,100	--	73
Electric furnace, 1 foot and under (not bundles)	19	4	150	--	110	60	1
Railroad rails	140	--	42	--	190	1	6
Turnings and borings	2,000	9	160	(3/)	2,200	(3/)	120
Slag scrap	790	110	1,400	4	2,200	210	170
Shredded or fragmentized	7,200	1,000	330	--	8,700	15	510
No. 1 busheling	3,800	77	120	--	3,800	87	250
Steel cans (post consumer)	250	17	64	--	350	--	76
All other carbon steel scrap	2,100	41	3,200	8	4,800	540	390
Stainless steel scrap	580	12	440	(3/)	1,000	8	43
Alloy steel (except stainless)	160	87	510	--	720	9	75
Ingot mold and stool scrap	18	--	130	97	96	140	23
Machinery and cupola cast iron	71	--	4	--	60	1	4
Cast-iron borings	200	--	(3/)	(3/)	190	(3/)	11
Motor blocks	8	--	--	--	(4/)	--	(4/)
Other iron scrap	470	52	440	--	970	150	370
Other mixed scrap	890	4	490	--	1,200	90	610
Total	41,000	2,200	14,000	280	56,000	2,400	4,800
Manufacturers of steel castings:							
Carbon steel:							
Low-phosphorus plate and punchings	770	(3/)	64	(3/)	860	(3/)	19
Cut structural and plate	190	1	6	(3/)	200	(3/)	16
No. 1 heavy melting steel	100	13	90	--	210	4	8
No. 2 heavy melting steel	11	--	10	--	24	--	(3/)
No. 1 and electric furnace bundles	31	--	--	--	27	--	4
No. 2 and all other bundles	--	--	--	--	--	--	--
Electric furnace, 1 foot and under (not bundles)	1	5	(3/)	--	6	--	(3/)
Railroad rails	12	--	1	--	13	6	1
Turnings and borings	40	--	8	--	48	--	1
Slag scrap	6	--	2	--	13	--	(3/)
Shredded or fragmentized	75	--	--	--	76	--	2
No. 1 busheling	93	--	7	--	100	--	3
Steel cans (post consumer)	3	--	30	--	34	--	(3/)
All other carbon steel scrap	140	--	300	2	440	(3/)	7
Stainless steel scrap	390	--	34	(3/)	430	2	15
Alloy steel (except stainless)	78	(3/)	63	--	140	(3/)	9
Ingot mold and stool scrap	10	--	--	(3/)	9	(3/)	1
Machinery and cupola cast iron	--	--	(3/)	--	(3/)	--	(3/)
Cast-iron borings	(3/)	--	1	--	1	--	(3/)
Motor blocks	(3/)	--	(3/)	--	(3/)	--	(3/)
Other iron scrap	10	--	8	(3/)	18	1	2
Other mixed scrap	53	--	2	14	68	1	4
Total	2,000	19	620	17	2,700	13	95

See footnotes at end of table.

TABLE 2--Continued
U.S. CONSUMER RECEIPTS, PRODUCTION, CONSUMPTION, SHIPMENTS, AND STOCKS
OF IRON AND STEEL SCRAP IN 1996, 1/ BY GRADE

(Thousand metric tons)

Grade	Receipts of scrap		Production of home scrap		Consumption of both purchased and home scrap	Shipments of scrap	Ending stocks, Dec. 31
	From brokers, dealers and other outside sources	From other own-company plants	Recirculating scrap from current operations	Obsolete scrap 2/			
Iron foundries and miscellaneous users:							
Carbon steel:							
Low-phosphorus plate and punchings		8	96	(3/)	910	(3/)	16
Cut structural and plate	1,200	53	6	(3/)	1,300	(3/)	49
No. 1 heavy melting steel	260	4	18	(3/)	280	2	8
No. 2 heavy melting steel	150	(3/)	--	--	150	--	3
No. 1 and electric furnace bundles	120	140	32	--	280	--	13
No. 2 and all other bundles	180	--	1	--	180	1	4
Electric furnace, 1 foot and under (not bundles)	140	1	1	--	140	1	3
Railroad rails	160	--	9	(3/)	180	--	7
Turnings and borings	60	65	3	--	130	4	4
Slag scrap	61	--	5	--	63	3	3
Shredded or fragmentized	1,400	97	(3/)	--	1,500	--	53
No. 1 busheling	820	91	38	--	910	38	23
Steel cans (post consumer)	15	--	--	--	15	--	(3/)
All other carbon steel scrap	110	(3/)	31	--	140	(3/)	6
Stainless steel scrap	5	--	5	--	9	(3/)	2
Alloy steel (except stainless)	12	--	1	--	13	--	2
Ingot mold and stool scrap	92	--	97	--	190	--	10
Machinery and cupola cast iron	740	--	270	2	1,000	2	50
Cast-iron borings	300	83	36	1	410	10	7
Motor blocks	290	9	650	--	940	(3/)	16
Other iron scrap	290	320	3,300	--	3,900	7	62
Other mixed scrap	320	4	250	(3/)	590	1	22
Total	7,500	880	4,800	3	13,000	68	360
Totals for all manufacturing types:							
Carbon steel:							
Low-phosphorus plate and punchings	2,000	8	160	(3/)	2,100	42	53
Cut structural and plate	4,900	75	770	51	5,700	49	420
No. 1 heavy melting steel	7,000	290	4,000	110	11,000	140	770
No. 2 heavy melting steel	5,200	54	670	10	5,900	5	460
No. 1 and electric furnace bundles	5,900	530	1,700	(3/)	7,200	840	490
No. 2 and all other bundles	1,300	14	3	--	1,300	1	77
Electric furnace, 1 foot and under (not bundles)	160	9	150	--	250	60	4
Railroad rails	320	--	52	(3/)	380	1	13
Turnings and borings	2,100	74	170	(3/)	2,400	4	130
Slag scrap	860	110	1,400	4	2,300	220	170
Shredded or fragmentized	8,600	1,100	330	--	10,000	15	570
No. 1 busheling	4,700	170	170	--	4,800	120	270
Steel cans (post consumer)	270	17	95	--	400	--	77
All other carbon steel scrap	2,300	41	3,500	10	5,400	540	410
Stainless steel scrap	980	12	480	(3/)	1,500	10	59
Alloy steel (except stainless)	250	87	570	--	880	9	86
Ingot mold and stool scrap	120	--	230	97	300	140	35
Machinery and cupola cast iron	810	--	280	2	1,100	3	54
Cast-iron borings	500	83	37	1	610	10	17
Motor blocks	300	9	650	(3/)	950	(3/)	17
Other iron scrap	760	380	3,700	(3/)	4,900	150	430
Other mixed scrap	1,300	7	740	14	1,900	91	630
Total	51,000	3,100	20,000	300	72,000	2,500	5,200

1/ Data are rounded to two significant digits; may not add to totals shown.

2/ Obsolete home scrap includes ingot molds, stools, and scrap from old equipment, buildings, etc.

3/ Less than 1/2 unit.

4/ Withheld to avoid disclosing company proprietary data; included with "Other iron scrap."

TABLE 3
U.S. CONSUMER RECEIPTS, PRODUCTION, CONSUMPTION, SHIPMENTS, AND STOCKS
OF PIG IRON AND DIRECT-REDUCED IRON IN 1996 1/

(Thousand metric tons)

	Receipts	Production	Consumption	Shipments	Stocks, Dec. 31
Manufacturers of pig iron, raw steel, and castings:					
Pig iron	9,200 2/	45,000	50,000	2,800	520
Direct-reduced iron	1,300 3/	--	1,300	W	270
Manufacturers of steel castings:					
Pig iron	11	--	11	(4/)	1
Direct-reduced iron	--	--	--	--	--
Iron foundries and miscellaneous users:					
Pig iron	1,100	--	1,100	19	79
Direct-reduced iron	W	--	W	--	(4/)
Totals for all manufacturing types:					
Pig iron	10,000	45,000	52,000	2,800	600
Direct-reduced iron	1,300	--	1,300	W	270

W Withheld to avoid disclosing company proprietary data.

1/ Data are rounded to two significant digits; may not add to totals shown.

2/ Includes 1,900 tons purchased by electric furnace steel producers.

3/ Includes 7,300 tons purchased by integrated steel producers.

4/ Less than 1/2 unit.

TABLE 4
U.S. CONSUMPTION OF IRON AND STEEL SCRAP, PIG IRON, AND DIRECT-REDUCED IRON (DRI) IN 1996,
BY TYPE OF FURNACE OR OTHER USE 1/

(Thousand metric tons)

	Manufacturers of pig iron and raw steel and castings			Manufacturers of steel castings			Iron foundries and miscellaneous users			Totals for all manufacturing types		
	Scrap	Pig iron	DRI	Scrap	Pig iron	DRI	Scrap	Pig iron	DRI	Scrap	Pig iron	DRI
Blast furnace	1,700	--	380	--	--	--	--	--	--	1,700	--	380
Basic oxygen process	16,000	49,000	200	--	--	--	--	--	--	16,000	49,000	200
Electric furnace	38,000	1,600	710	2,700	11	--	5,100	580	--	46,000	2,200	710
Cupola furnace	2	--	--	--	--	--	8,100	530	W	8,100	530	W
Other (including air furnaces)	4	--	--	3	--	--	(2/)	(2/)	--	23	(2/)	--
Direct castings 3/	--	42	--	--	--	--	--	--	--	--	42	--
Total	56,000	50,000	1,300	2,700	11	--	13,000	1,100	W	72,000	52,000	1,300

W Withheld to avoid disclosing company proprietary data.

1/ Data are rounded to two significant digits; may not add to totals shown.

2/ Withheld to avoid disclosing company proprietary data; included with "Electric furnace."

3/ Includes ingot molds and stools.

TABLE 5
IRON AND STEEL SCRAP SUPPLY 1/ AVAILABLE FOR CONSUMPTION IN 1996, BY REGION AND STATE 2/

(Thousand metric tons)

Region and State	Receipts of scrap		Production of home scrap		Shipments of scrap 4/	New supply available for consumption
	From brokers, dealers, and other outside sources	From other own company plants	Recirculating scrap resulting from current operations	Obsolete scrap 3/		
New England and Middle Atlantic:						
Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont	53	--	23	W	(5/)	76
New Jersey and New York	1,500	W	92	--	5	1,600
Pennsylvania	4,100	W	2,800	W	35	7,000
Total	5,700	110	2,900	84	35	8,700
North Central:						
Illinois	4,200	120	1,500	12	220	5,600
Indiana	4,000	160	5,000	42	610	8,600
Iowa, Nebraska, South Dakota	1,300	4	210	--	W	1,500
Kansas and Missouri	1,100	1	160	--	(5/)	1,300
Michigan	3,200	780	1,900	2	180	5,800
Minnesota	430	140	150	(5/)	W	710
Ohio	6,400	810	2,400	41	1,200	8,500
Wisconsin	1,100	4	930	(5/)	(5/)	2,100
Total	22,000	2,000	12,000	97	2,200	34,000
South Atlantic:						
Delaware and Maryland	630	1	480	--	W	1,100
Florida and Georgia	1,200	--	190	--	W	1,400
North Carolina and South Carolina	1,700	8	220	--	--	1,900
Virginia and West Virginia	1,500	130	600	W	W	2,200
Total	5,100	140	1,500	W	100	6,600
South Central:						
Alabama and Mississippi	2,600	W	810	W	W	3,400
Arkansas, Louisiana, Oklahoma	5,500	W	280	W	1	5,800
Kentucky and Tennessee	2,300	2	680	--	W	3,000
Texas	3,900	770	730	8	6	5,300
Total	14,000	830	2,500	34	100	17,000
Mountain and Pacific:						
Arizona, Colorado, Idaho, Montana, Utah	1,800	(5/)	520	W	W	2,400
California, Oregon, Washington	2,000	W	270	1	13	2,300
Total	3,800	W	790	W	W	4,700
Grand total	51,000	3,100	20,000	300	2,500	71,000

W Withheld to avoid disclosing company proprietary data; included in "Total" or "Grand Total."

1/ Supply available for consumption is a net figure computed by adding production to receipts and deducting scrap shipped during the year. The difference in stock levels at the beginning and end of the year is not taken into consideration.

2/ Data are rounded to two significant digits; may not add to totals shown.

3/ Obsolete scrap includes ingot molds, stools and scrap from old equipment, buildings, etc.

4/ Includes scrap shipped, transferred, or otherwise disposed of during the year.

5/ Less than 1/2 unit.

TABLE 6
U.S. CONSUMPTION OF IRON AND STEEL SCRAP 1/ AND PIG IRON 2/ IN 1996, BY REGION AND STATE 3/

(Thousand metric tons)

Region and State	Manufacturers of pig iron and raw steel and castings		Manufacturers of steel castings		Iron foundries and miscellaneous users		Totals for all manufacturing types	
	Scrap	Pig iron	Scrap	Pig iron	Scrap	Pig iron	Scrap	Pig iron
New England and Middle Atlantic:								
Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Rhode Island, Vermont	1,300	24	17	(4/)	390	30	1,700	54
Pennsylvania	6,200	2,900	220	3	620	84	7,000	3,000
Total	7,500	2,900	240	3	1,000	110	8,700	3,000
North Central:								
Illinois	5,100	2,600	82	1	440	33	5,600	2,700
Indiana	7,600	17,000	92	1	1,300	160	9,000	17,000
Iowa, Kansas, Minnesota, Missouri, Nebraska, South Dakota, Wisconsin	2,400	3	510	2	2,300	290	5,300	300
Michigan	2,900	5,400	38	(4/)	2,800	140	5,800	5,500
Ohio	6,900	11,000	430	2	1,400	130	8,700	11,000
Total	25,000	36,000	1,200	6	8,300	760	34,000	36,000
South Atlantic:								
Delaware, Maryland, Virginia, West Virginia	2,600	4,600	4	W	590	W	3,200	4,600
Florida, Georgia, North Carolina, South Carolina	2,900	140	2	W	450	W	3,300	190
Total	5,500	4,700	6	1	1,000	70	6,500	4,800
South Central:								
Alabama, Kentucky, Mississippi, Tennessee	4,200	4,000	300	W	1,900	110	6,400	4,200
Arkansas, Louisiana, Oklahoma	4,800	W	780	W	130	W	5,700	630
Texas	4,700	W	85	W	490	W	5,300	260
Total	14,000	4,900	1,200	W	2,500	150	17,000	5,000
Mountain and Pacific:								
Arizona, Colorado, Idaho, Montana, Utah	2,300	W	21	(4/)	120	W	2,400	2,100
California, Oregon, Washington	2,000	W	130	(4/)	210	W	2,300	95
Total	4,200	2,200	150	(4/)	330	8	4,700	2,200
Grand total	56,000	50,000	2,700	11	13,000	1,100	72,000	52,000

W Withheld to avoid disclosing company proprietary data; included in "Total" or "Grand Total."

1/ Includes recirculating scrap resulting from current operations and home-generated obsolete scrap.

2/ Includes molten pig iron used for ingot molds and direct castings.

3/ Data are rounded to two significant digits; may not add to totals shown.

4/ Less than 1/2 unit.

TABLE 7
U.S. CONSUMER STOCKS OF IRON AND STEEL SCRAP AND PIG IRON, DECEMBER 31, 1996,
BY REGION AND STATE 1/

(Thousand metric tons)

Region and State	Carbon steel 2/	Stainless steel	Alloy steel 3/	Cast iron 4/	Other grades of scrap	Total scrap	Pig iron
New England and Middle Atlantic:							
Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, Vermont	1	W	W	1	W	3	W
New Jersey and New York	84	W	W	3	W	91	W
Pennsylvania	330	33	36	34	6	440	4
Total	420	36	38	38	7	540	8
North Central:							
Illinois	320	W	W	13	W	340	19
Indiana	480	5	W	110	13	610	220
Iowa, Kansas, Missouri, Nebraska, South Dakota	130	W	5	6	7	150	14
Michigan	160	(5/)	1	17	56	230	7
Minnesota and Wisconsin	50	2	(5/)	9	1	62	39
Ohio	380	4	21	33	W	440	33
Total	1,500	11	28	190	80	1,800	330
South Atlantic:							
Delaware, Maryland, Virginia, West Virginia	190	W	W	14	6	210	W
Florida, Georgia, North Carolina, South Carolina	190	W	W	19	5	210	W
Total	370	W	W	33	11	420	110
South Central:							
Alabama, Kentucky, Mississippi, Tennessee	510	W	W	260	W	1,300	W
Arkansas, Louisiana, Oklahoma	470	10	W	2	W	490	W
Texas	360	W	11	23	W	390	32
Total	1,300	11	13	290	490	2,100	130
Mountain and Pacific:							
Arizona, Colorado, Idaho, Montana, Utah	140	(5/)	W	W	--	140	W
California, Oregon, Washington	130	1	W	W	49	190	W
Total	270	1	5	8	49	330	19
Grand total	3,900	59	86	560	630	5,200	600

W Withheld to avoid disclosing company proprietary data; included in "Total" or "Grand Total."

1/ Data are rounded to two significant digits; may not add to totals shown.

2/ Excludes rerolling rails.

3/ Excludes stainless steel.

4/ Includes borings.

5/ Less than 1/2 unit.

TABLE 8
U.S. AVERAGE MONTHLY PRICE AND COMPOSITE PRICE FOR NO. 1 HEAVY MELTING
STEEL, WITH ANNUAL AVERAGES FOR 1995 AND 1996 1/

(Dollars per metric ton)

Month	Chicago	Philadelphia	Pittsburgh	Composite price
January	141.14	131.04	150.72	140.97
February	142.22	131.64	147.63	140.50
March	137.30	125.47	137.72	133.50
April	137.30	125.00	134.63	132.31
May	140.25	128.75	139.71	136.23
June	137.30	128.93	136.51	134.25
July	132.38	125.98	132.38	130.24
August	134.79	124.10	135.33	131.40
September	138.13	125.98	138.13	134.08
October	128.82	116.22	131.39	125.47
November	118.85	102.51	118.60	113.32
December	118.60	107.65	118.60	114.95
Annual average:				
1996	133.92	122.77	135.11	130.60
1995	140.91	124.08	140.09	135.03

1/ Calculated by the U.S. Geological Survey from prices published in American Metal Market.

TABLE 9
U.S. EXPORTS OF IRON AND STEEL SCRAP, 1/ BY COUNTRY 2/

(Thousand metric tons and thousand dollars)

Country	1995		1996	
	Quantity	Value	Quantity	Value
Belgium	24	23,600	4	2,460
Canada	1,650	222,000	1,250	170,000
China	199	48,600	247	50,300
Colombia	24	2,520	9	1,070
Germany	3	1,080	6	1,080
Greece	25	3,340	(3/)	16
Hong Kong	106	23,900	88	22,800
India	647	95,800	418	58,800
Indonesia	45	7,470	28	4,300
Italy	125	19,700	8	6,530
Japan	709	131,000	157	45,800
Korea, Republic of	3,270	524,000	2,590	391,000
Malaysia	386	52,500	607	77,000
Mexico	821	110,000	1,190	158,000
Netherlands	16	16,100	4	2,330
Pakistan	6	1,550	2	1,390
Peru	(3/)	77	--	--
Philippines	45	8,800	90	12,500
Singapore	3	1,970	4	2,430
South Africa	26	8,950	13	11,400
Spain	88	68,600	65	49,900
Sweden	13	8,520	9	8,630
Taiwan	147	33,700	316	69,500
Thailand	423	61,500	175	23,300
Turkey	1,390	190,000	852	113,000
United Kingdom	26	5,260	4	3,060
Venezuela	144	19,100	265	47,400
Other	73	9,160	44	10,100
Total	10,400	1,700,000	8,440	1,340,000

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Excludes used rails for rerolling and other uses and ships, boats and other vessels for scrapping. Export valuation is "free alongside ship" (f.a.s.) value. The U.S. exported scrap to 75 countries in 1995 and 73 countries in 1996.

3/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 10
U.S. EXPORTS OF IRON AND STEEL SCRAP, 1/ BY CUSTOMS DISTRICT 2/

(Thousand metric tons and thousand dollars)

Customs district	1995		1996	
	Quantity	Value	Quantity	Value
Boston, MA	649	83,700	572	76,600
Buffalo, NY	104	42,500	88	32,800
Chicago, IL	18	2,030	4	907
Cleveland, OH	10	1,880	(3/)	75
Columbia - Snake	150	24,000	107	21,800
Detroit, MI	309	55,300	256	43,700
Honolulu, HI	102	15,600	95	13,900
Houston-Galveston, TX	81	54,000	53	34,300
Laredo, TX	419	52,900	570	72,400
Los Angeles, CA	1,910	337,000	1,180	205,000
Miami, FL	102	15,000	127	20,800
New Orleans, LA	94	83,800	172	62,200
New York, NY	1,950	287,000	1,170	178,000
Norfolk, VA	229	25,900	211	27,500
Pembina, ND	421	49,500	263	29,900
Philadelphia, PA	533	69,700	279	34,400
Portland, ME	310	40,600	164	20,500
Providence, RI	459	61,400	363	46,400
San Francisco, CA	918	169,000	1,050	184,000
Seattle, WA	403	70,600	390	60,100
Tampa, FL	268	38,100	343	45,000
Other	996	117,000	990	135,000
Total	10,400	1,700,000	8,440	1,340,000

1/ Excludes used rails for rerolling and other uses and ships, boats and other vessels for scrapping. Export valuation is "free alongside ship" (f.a.s.) value.

2/ Data are rounded to three significant digits; may not add to totals shown.

3/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 11
U.S. EXPORTS OF IRON AND STEEL SCRAP, BY GRADE 1/ 2/

(Thousand metric tons and thousand dollars)

Grade	1995		1996	
	Quantity	Value	Quantity	Value
No. 1 heavy melting scrap	2,400	332,000	1,920	246,000
No. 2 heavy melting scrap	735	95,200	508	61,800
No. 1 bundles	189	24,800	110	13,500
No. 2 bundles	232	28,500	126	14,200
Shredded steel scrap	2,850	410,000	2,720	370,000
Borings, shovelings and turnings	277	29,100	254	25,800
Cut plate and structural	516	75,600	559	73,500
Tinned iron or steel	88	24,700	51	18,700
Remelting scrap ingots	8	2,230	3	781
Stainless steel scrap	368	325,000	303	234,000
Other alloy steel scrap	682	114,000	674	123,000
Other steel scrap 3/	1,040	118,000	598	95,300
Iron scrap	1,050	118,000	627	68,700
Total	10,400	1,700,000	8,440	1,340,000
Ships, boats, and other vessels for scrapping	6	875	24	2,710
Used rails for rerolling and other uses 4/	23	5,960	21	6,900
Total exports	10,500	1,710,000	8,490	1,350,000

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Export valuation is on a "free alongside ship" (f.a.s.) value.

3/ Includes tinplate and terneplate.

4/ Includes mixed (used plus new) rails. See table 15 for details.

Source: Bureau of the Census.

TABLE 12
U.S. IMPORTS FOR CONSUMPTION OF IRON AND STEEL SCRAP, BY COUNTRY 1/ 2/

(Thousand metric tons and thousand dollars)

Country	1995		1996	
	Quantity	Value	Quantity	Value
Bahamas, The	2	111	1	85
Belgium	(3/)	141	(3/)	24
Brazil	23	1,530	8	1,670
Canada	1,610	217,000	1,910	247,000
China	7	1,020	1	1,260
Colombia	(3/)	101	(3/)	18
Costa Rica	(3/)	8	1	91
Dominican Republic	7	836	5	884
France	1	114	(3/)	56
Germany	21	3,190	75	10,800
Israel	1	63	(3/)	255
Jamaica	9	936	4	483
Japan	67	9,630	51	8,230
Korea, Republic of	(3/)	12	(3/)	29
Martinique	--	--	1	64
Mexico	165	34,300	114	27,600
Netherlands	(3/)	8	3	3,100
Panama	4	571	12	1,930
Peru	--	--	31	450
Philippines	(3/)	77	(3/)	6
Poland	(3/)	10	--	--
Russia	13	1,640	(3/)	76
Singapore	(3/)	2	(3/)	111
South Africa	--	--	36	3,300
Switzerland	(3/)	37	(3/)	70
Trinidad and Tobago	1	140	16	712
United Kingdom	2	275	69	8,330
Venezuela	152	11,300	262	24,600
Other	1	575	1	1,250
Total	2,090	284,000	2,600	342,000

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Excludes used rails for rerolling and other uses and ships, boats and other vessels for scrapping. Import valuation is customs value. The U.S. imported scrap from 42 countries in 1995 and 49 countries in 1996.

3/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 13
U.S. IMPORTS FOR CONSUMPTION OF IRON AND STEEL SCRAP, BY CUSTOMS DISTRICT 1/ 2/

(Thousand metric tons and thousand dollars)

Customs district	1995		1996	
	Quantity	Value	Quantity	Value
Baltimore, MD	22	1,270	22	1,430
Buffalo, NY	405	66,100	418	63,400
Charleston, SC	54	6,460	71	9,250
Chicago, IL	59	5,710	17	2,760
Cleveland, OH	59	7,210	67	6,480
Detroit, MI	887	109,000	1,200	145,000
El Paso, TX	41	5,260	45	6,240
Laredo, TX	73	21,900	49	16,400
New Orleans, LA	44	4,880	208	24,500
New York, NY	1	141	(3/)	677
Ogdensburg, NY	20	4,180	15	4,020
Pembina, ND	4	2,720	12	2,950
San Diego, CA	49	6,870	22	5,590
Seattle, WA	311	32,500	392	40,900
Other	57	9,520	67	12,600
Total	2,090	284,000	2,600	342,000

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Excludes used rails for rerolling and other uses and ships, boats and other vessels for scrapping. Import valuation is customs value.

3/ Less than 1/2 unit.

Source: Bureau of the Census.

TABLE 14
U.S. IMPORTS FOR CONSUMPTION OF IRON AND STEEL SCRAP, BY CLASS 1/ 2/

(Thousand metric tons and thousand dollars)

Class	1995		1996	
	Quantity	Value	Quantity	Value
No. 1 heavy melting scrap	52	5,900	112	13,200
No. 2 heavy melting scrap	22	2,490	22	2,650
No. 1 bundles	208	22,800	233	27,500
No. 2 bundles	31	3,600	18	2,140
Shredded steel scrap	104	14,100	84	11,200
Borings, shovelings and turnings	124	11,500	121	12,000
Cut plate and structural	133	9,140	164	14,300
Tinned iron or steel	16	2,390	65	5,690
Remelting scrap ingots	63	9,830	82	12,900
Stainless steel scrap	43	33,800	51	28,500
Other alloy steel scrap	252	33,500	345	48,300
Other steel scrap 3/	896	112,000	1,100	137,000
Iron scrap	143	23,100	210	27,000
Total	2,090	284,000	2,600	342,000
Ships, boats, and other vessels for scrapping	(4/)	2,010	(4/)	90
Used rails for rerolling and other uses 5/	186	31,400	248	43,400
Total imports	2,270	317,000	2,890	386,000

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Import valuation is customs value.

3/ Includes tinplate and terneplate.

4/ Less than 1/2 unit.

5/ Includes mixed (used plus new) rails. See table 16 for details.

Source: Bureau of the Census.

TABLE 15
U.S. EXPORTS OF USED RAILS FOR REROLLING AND OTHER USES, BY COUNTRY 1/ 2/

Country	1995		1996	
	Quantity (metric tons)	Value (thousand dollars)	Quantity (metric tons)	Value (thousand dollars)
Brazil	287	62	54	70
Canada	2,720	1,020	7,040	2,890
Chile	71	113	102	102
Dominican Republic	218	57	372	111
Italy	102	106	--	--
Japan	13	3	--	--
Malaysia	705	185	17	9
Mexico	18,100	3,860	12,400	2,830
Peru	--	--	323	148
Other	997	553	1,010	740
Total	23,200	5,960	21,300	6,900

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Exports contain mixed (used plus new) rails totaling 616 metric tons valued at \$640,000 (revised) in 1995 and 715 metric tons valued at \$548,000 in 1996. Export valuation is "free alongside ship" (f.a.s.) value.

Source: Bureau of the Census.

TABLE 16
U.S. IMPORTS FOR CONSUMPTION OF USED RAILS FOR REROLLING AND
OTHER USES, BY COUNTRY 1/ 2/

Country	1995		1996	
	Quantity (metric tons)	Value (thousand dollars)	Quantity (metric tons)	Value (thousand dollars)
Australia	--	--	60	28
Canada	58,100	11,000	89,200	21,600
Germany	--	--	32	52
Italy	--	--	57	173
Japan	1,950	957	278	204
Poland	18,400	5,270	32,200	5,370
Russia	108,000	14,200	126,000	15,100
Slovakia	--	--	328	806
Other	10 r/	38 r/	16	105
Total	186,000	31,400	248,000	43,400

r/ Revised.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Import valuation is customs value.

Source: Bureau of the Census.

TABLE 17
U.S. EXPORTS OF DIRECT REDUCED IRON (DRI), BY COUNTRY 1/ 2/

Country	1995		1996	
	Quantity (metric tons)	Value (thousand dollars)	Quantity (metric tons)	Value (thousand dollars)
Argentina	319	34	--	--
Australia	803	85	1,270	134
Canada	--	--	22	3
Colombia	64	7	397	42
Germany	--	--	30	3
Japan	775	82	--	--
Italy	--	--	59	6
Korea, Republic of	--	--	321	34
Mexico	285	30	161	17
Netherlands	--	--	296	31
Other	2350 r/	252 r/	326	34
Total	4,600	490	2,880	304

r/ Revised.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Data are for steelmaking grade DRI only.

Source: Bureau of the Census.

TABLE 18
U.S. IMPORTS FOR CONSUMPTION OF DIRECT REDUCED IRON (DRI), BY COUNTRY 1/ 2/

Country	1995		1996	
	Quantity (metric tons)	Value (thousand dollars)	Quantity (metric tons)	Value (thousand dollars)
Canada	430	47.7	117	17.2
China	1,500	159	--	--
Russia	33700	4550	--	--
Sweden	--	--	995	105
Ukraine	60300	7820	35900	4710
Venezuela	1,090,000	133000	1,010,000	131000
Total	1,190,000	145,000	1,050,000	136,000

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Data are for steelmaking grade DRI only.

Source: Bureau of the Census.

TABLE 19
U.S. EXPORTS OF PIG IRON, BY COUNTRY 1/ 2/

Country	1995		1996	
	Quantity (metric tons)	Value (thousand dollars)	Quantity (metric tons)	Value (thousand dollars)
Argentina	707	62	--	--
Australia	2,400	211	3,140	276
Brazil	2,770	244	--	--
Canada	3,750	894	13,000	2,750
China	82	18	364	32
Hong Kong	73	15	--	--
India	292	35	--	--
Japan	--	--	1,230	112
Korea, Republic of	1,350	119	--	--
Mexico	32,200	3,730	26,500	3,460
Netherlands	273	27	--	--
Peru	984	87	--	--
Singapore	722	64	--	--
Taiwan	--	--	1,040	92
United Kingdom	6,660	586	67	39
Venezuela	1,680	290	2,770	253
Other	484	63	234	23
Total	54,400	6,450	48,400	7,040

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes the following grades of pig iron: less than or equal to 0.5 percent phosphorus content; greater than 0.5 percent phosphorus content; and alloy grade. Export valuation is "free alongside ship" (f.a.s.) value.

Source: Bureau of the Census.

TABLE 20
U.S. IMPORTS FOR CONSUMPTION OF PIG IRON, BY COUNTRY 1/ 2/

Country	1995		1996	
	Quantity (metric tons)	Value (thousand dollars)	Quantity (metric tons)	Value (thousand dollars)
Argentina	--	--	27,400	3,750
Brazil	1,530,000	253,000	1,630,000	253,000
Canada	88,100	25,400	102,000	22,900
China	57,400	8,590	21,400	2,960
Cote d'Ivoire	1,280	274	--	--
Estonia	39,400	5,910	--	--
France	--	--	20,700	2,860
Germany	--	--	39,600	5,210
Japan	37,500	5,780	35,500	4,990
Latvia	--	--	10,000	1,430
Mexico	66	15	--	--
Norway	--	--	3,000	532
Russia	256,000	38,000	261,000	35,900
South Africa	82,600	17,100	113,000	20,000
Swaziland	49	15	--	--
Switzerland	17,100	3,600	--	--
Turkey	--	--	40,000	6,130
Ukraine	253,000	33,600	182,000	26,100
Venezuela	--	--	36,000	4,980
Total	2,360,000	391,000	2,520,000	390,000

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes the following grades of pig iron: less than or equal to 0.5 percent phosphorus content; greater than 0.5 percent phosphorus content; and alloy grade. Import valuation is customs value.

Source: Bureau of the Census.