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. The steelmaking and the foundry industries in the United States are highly dependent upon the ready availability of scrap from manufacturing operations and from the recovery of products that are no longer used or needed.

The dynamic ferrous scrap industry has been evolving by mergers and acquisitions as the domestic steelmaking industry reaches new levels of productivity. Scrap brokers and dealers, challenged by the increasing availability of other iron substitutes, have been forming partnerships with steelmakers, and at least one scrap dealer has begun to produce steel. Steelmakers have been establishing their own scrap-processing units in an effort to assure raw material supplies and quality as new steelmaking capacity comes online to compete with these supplies.

Steel scrap recycling conserves raw materials, energy, and landfill space. The domestic steel industry recycles millions of tons per year of steel cans, automobiles, appliances, construction materials, and other steel products. The industry's overall recycling rate is about 65%. Remelting of scrap requires much less energy than the production of iron and steel products from iron ore. Each year, steel recycling saves the energy equivalent of electrical power needed by one-fifth of the houses in the United States (about 18 million) for 1 year. 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. Every ton of steel recycled saves about 1.1 tons of iron ore, 0.6 tons of coal, and 54 kg of limestone (Steel Recycling Institute, 1997, A few facts about steel—North America's #1 recycled material, accessed July 29, 1997, at URL http://www.recycle-steel.org/fact/index.html).

Legislation and Government Programs

The steel industry has improved product yield and quality, its ability to meet customer specifications, energy and worker efficiency, and environmental control partly through employee involvement in decisionmaking processes. Pursuant to Section 8(a)(2) of the 1935 National Labor Relations Act, however, it is illegal for employees and management to form working groups in nonunion workplaces to address matters of mutual interest, such as work scheduling, compensation, and safety and health. Notwithstanding Federal law, 13 States have laws requiring the establishment of employee-involvement committees to deal with worker health and safety. The purpose of the legislation was to remove obstacles that prevent cooperation in the workplace between labor and management.

The steel industries in Canada, Mexico, and the United States, represented by the Steel Manufacturers Association (SMA), lobbied for reform of the Merchant Marine Act of 1920 (the Jones Act). According to the SMA, the Jones Act, which requires that transportation of goods between U.S. coastal ports be carried only by U.S.-owned, U.S.-flagged, U.S.-manned, and U.S.-built ships, costs U.S. taxpayers approximately $2.8 billion in lost economic activity and the U.S. Treasury $3 billion in lost tax revenue. Legislation was introduced in mid-1997 that would eliminate the requirement that coastal trade vessels be U.S. made.

Environment

Steel mills receiving ferrous scrap have been exposed without warning to radioactive materials at an alarming rate. Contaminated scrap is in the form of radioactive sources shielded in lead, oil-drilling pipe, and scrap from decommissioned nuclear power and U.S. Department of Energy (DOE) facilities. Of particular concern were radioactive gauges that were discarded or lost by manufacturing operations, medical centers, or the military. When shielded by lead, these radioactive objects can pass through sensitive radiation detection devices used by electric-arc furnace steelmakers. The U.S. Nuclear Regulatory Agency (NRC) reported that every year, about 200 radioactive sources and devices containing radioactive materials have entered the scrap supply in an uncontrolled manner (Kelly, 1997). Since 1983, more than 2,400 detections of radioactive material have been reported, more than 300 in the United States. During this period, 40 confirmed meltings of this material have taken place, 25 of which were in the United States. Costs of accidental meltings average $10 million each. A minimill is reported to have spent as much as $23 million for decontamination, disposal, and shutdown (Kelly, 1997). The American Iron and Steel Institute appealed to the NRC to implement an immediate rulemaking process that would monitor, track, and enforce any violations of generally licensed radioactive sources. In response, the NRC expressed the need to conduct additional studies of the problem.

In another Government-related matter, steelmaker associations opposed plans announced by DOE to release 112,000 tons of radioactive metal scrap, including steel scrap from decommissioned powerplants, into the public scrap supply (Kelly, 1997). Although the DOE assured everyone that there would be no health hazard, even such low-level radioactivity was expected by steelmakers to trigger alarms at minimills, thereby costing expensive delays for decontamination.

The U.S. Environmental Protection Agency's (EPA) proposal of a new standard for the size of airborne particles met with resistance by the steel industry. The EPA wanted to reduce the standard from 10 microns (PM10) to 2.5 microns or smaller (PM2.5). According to the EPA, the PM10 standard does not protect against fine particles, produced by fossil fuel combustion, that lodge deep in the lungs and that research indicates pose the greatest health hazard. The SMA responded to the proposal by pointing out that the results of proposed regulations could include

the elimination of thousands of high-paying, high-skilled manufacturing jobs in the steel and supporting industries and produce no quantifiable benefits to public health. Imports of steel products to satisfy domestic demand would come from countries having few or no environmental regulations comparable to those of the United States. According to the SMA, the result would be an increase in worldwide environmental degradation. Also, the congressionally appointed Clean Air Act Scientific Advisory Committee, among others, determined that no causal relation between PM2.5 and adverse health effects are known. The Committee determined that, for economic, social, and environmental reasons, a better understanding of the impact, if any, of PM2.5 on public health is needed before promulgating a blanket rule covering all particles under 2.5 microns. On July 18, 1997, the EPA promulgated final rules; the effective date of the new regulations was September 16, 1997.

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 59% of the known establishments responded to the surveys. Their responses represented about 67% of estimated total scrap consumption by this class of consumers. The remaining 33% of scrap consumption was estimated on the basis of prior reports. For manufacturers of steel castings, iron foundries, and miscellaneous users, about 34% of the surveyed establishments, representing about 56% of estimated scrap consumption by these consumers, responded to the annual survey. Total consumption for these two classes of consumers was estimated by using statistical methods and prior reports. Actual survey data accounted for about 55% of total estimated scrap consumption by all classes of scrap consumers.

In 1997, brokers, dealers, and other outside sources supplied domestic consumers with 53 million metric tons of all types of ferrous scrap at an estimated delivered value of nearly $6.9 billion and exported 8.9 million tons (excluding used rails for rerolling and other uses and ships, boats, and other vessels for scrapping) valued at $1.4 billion. In 1996, domestic consumers received 50.0 million tons at an estimated delivered value of about $6.5 billion; exports totaled 8.4 million tons valued at $1.3 billion. This represented a tonnage increase during 1997 of about 6% for received quantities and a tonnage increase of about 6% for exported quantities. The total value of received and exported scrap grades increased by about 6% from that of 1996.

Raw steel production was 98.5 million tons in 1997 compared with 95.5 million tons in 1996 (American Iron and Steel Institute, 1997). The shares of raw steel produced by electric and basic oxygen furnaces were 44% and 56%, respectively, with electric furnace production increasing by nearly 6% during 1997. Continuous cast steel production represented 95% of total raw steel production compared with 93% in 1996. Raw steel production capability was 121 million tons compared with 116 million tons in 1996. Raw steel capability use was 89.5% compared with 90.7% in 1996.

Steel mills accounted for 83% of all scrap received from brokers, dealers, and other outside sources; iron foundries and miscellaneous users received nearly 15%; and steel foundries received 2%. The apparent total domestic consumption of ferrous scrap comprised 53 million tons net receipts (total receipts minus shipments) and 20 million tons of home scrap. Stocks of ferrous scrap at consumers' plants increased by nearly 6% to 5.5 million tons. Total domestic consumption was 73 million tons, an increase of nearly 3% over that of 1996 (revised). The total market for U.S. produced scrap (net receipts plus exports minus imports) was 59.1 million tons compared with 56.8 million tons in 1996. Feedstock used in electric furnaces by all steel and iron product manufacturers comprised scrap, 94%; pig iron, 4.6%; and direct reduced iron (DRI), 1.5%. Consumption of DRI was 11% greater than that of 1996.

Net shipments of all grades of steel mill products were 96.0 million tons, an increase of 4.9% from the 91.5 million tons shipped in 1996 (American Iron & Steel Institute, 1997). Imports of steel mill products increased to 28.3 million tons from 26.5 million tons in 1996. Exports of steel mill products increased to 5.8 million tons from 4.6 million tons in 1996. The U.S. apparent supply of steel mill products increased to 114 million tons from 108 million tons in 1996. As a share of the U.S. market, imports of steel mill products was practically unchanged at 25% during 1996 and 1997. Pig iron production increased to 49.6 million tons from 49.4 million tons (revised) in 1996. As reported by the U.S. Bureau of the Census, iron castings shipments totaled an estimated 9.7 million tons (revised) during each of the years 1996 and 1997. Steel castings shipments (including investment castings) totaled 1.2 million tons in 1997, up slightly from 1.1 million tons in 1996.

Transportation

Railroads were the main form of transportation of ferrous scrap in the U.S. During the decade from 1986 through 1995, transport of scrap material, mostly ferrous scrap, increased by more than 50% to 623,000 carloads each year (Woodall, 1997). As more minimills come online, scrap volume in the railroad system is expected to continue increasing. Also, as competition for high-quality scrap increases, buyers need to look farther afield to satisfy requirements. Railroads have invested many millions of dollars in car fleets to increase efficiency and competitiveness. CSX Transportation, for example, spent $55 million in 1996 and 1997 on rail cars. Railroads have increased their value to the metals industry through consolidation. The joint acquisition of Conrail by CSX and Norfolk Southern, which offers the lower cost efficiency of a single-line shipper, is an example of how railroads are serving customers better.

Increasingly, new minimills with electric furnaces needing raw materials are being located beyond historical steelmaking areas and along or near navigable rivers. Only nine minimills were located along the inland river system a decade ago, whereas by 1998, 17 minimills will be along these rivers plus another 30 mills within 150 miles of a navigable river (Pinkham, 1997). Sources of scrap are mainly from the Pittsburgh and the Chicago areas. Barge shipping is the most economical way of handling bulk cargos, such as ferrous scrap and scrap substitutes. Rail shipping is as much as three times more expensive, and the cost of trucking is as much as eight times greater. Tonnage of cargo to

and from the U.S. steel industry, including minimills, integrated steel mills, and foundries, in 1997 is expected to be about double the 18.6 million tons in 1996 (Woodall, 1997). The port of New Orleans has changed from a net exporter of scrap a few years ago to a port handling significant international and domestic imports of scrap and other raw materials.

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 $130.45; the price ranged from a low of $121.80 in April to a high of $136.15 in November and December. 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 $125.80; the price had ranged from $116.38 in April to $132.54 in November. These 1997 average composite prices were not significantly different from those of 1996.

On the basis of 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 by 3% to $805 per ton from $831 per ton in 1996.

The average value of total ferrous scrap exports (excluding used rails for rerolling and other uses, and ships, boats, and other vessels for scrapping) decreased by almost 7%, to about $152 per ton compared with that of 1996. The average value of total imports, $140 per ton, was not significantly different from that of 1996.

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 in 1997 (including used rails for rerolling and other uses and ships, boats, and other vessels for scrapping) was $923 million and 5.8 million tons (Bureau of the Census, unpub. data, 1997). This represented a decrease of more than 4% in value and an increase of nearly 4% in quantity compared with the 1996 surplus of $964 million and 5.6 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 59 countries (2 less than the previous year) and totaled 7.62 million tons (2% increase) valued at $974 million (1% decrease) for an average of $127 per ton (Bureau of the Census, unpub. data, 1997). The largest tonnages went to the Republic of Korea, 3.07 million tons; Mexico, 1.36 million tons; Canada, 978,000 tons; Turkey, 555,000 tons; and Taiwan, 521,000 tons. These countries received 85% of the total quantity, valued at $801 million, which was 82% of the total value.

Total U.S. exports of stainless steel scrap went to 38 countries (4 less than the previous year) and consisted of 370,000 tons (22% increase) valued at $231 million (1% decrease) averaging $623 per ton (19% decrease) (Bureau of the Census, unpub. data, 1997). The largest tonnages went to the Republic of Korea, 114,000 tons; Spain, 59,600 tons; Taiwan, 49,300 tons; Mexico, 49,200 tons, and Canada, 40,000 tons. These countries received 84% of the total quantity, valued at $197 million, which was 85% of the total value.

U.S. exports of alloy steel scrap (excluding stainless steel) were shipped to 45 countries (2 more than the previous year) and consisted of 964,000 tons (43% increase) valued at $145 million (18% decrease) for an average of $150 per ton (18% decrease) (Bureau of the Census, unpub. data, 1997). The largest tonnages went to Canada, 477,000 tons (49% increase) and Mexico, 348,000 tons (29% increase). These countries received 86% of the total quantity, valued at $112 million, which was 77% 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 the 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. China, India, and Japan individually imported only about one-fourth of that imported by the Republic of Korea.

Outlook

The Asian financial crisis, which began on July 2 when Thailand devalued its currency, had not responded favorably by yearend to more than $100 billion in rescue loans. Countries with weakening economies were Japan, Malaysia, Hong Kong, Indonesia, Thailand, the Republic of Korea, Taiwan, Singapore, and China. Bankruptcies and joblessness were rising in Asia as its stock markets and currencies were declining. Asian imports of U.S. steel products declined. U.S. exporters reported that scrap sales to Asian countries declined drastically during December. The cumulative effect has been an abundance of scrap in the United States and a decline of scrap prices. Asian and U.S. steel mills will likely be forced to cut production, thereby causing an oversupply of scrap and falling prices.

The Asian crisis is expected to continue into 1998 and perhaps beyond; the degree to which it will affect the U.S. economy as a whole and the steel and scrap industries specifically is not known. Nevertheless, 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, the Commonwealth of Independent States, and Latin America.

As more steel is produced worldwide in electric furnaces and as

integrated mills increase usage of scrap in blast furnaces for environmental reasons, demand for scrap supplies will increase. 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. Any scrap shortage that develops will be one of quality rather than quantity. Obsolete scrap is of limited suitability for the production of flat products because of the contained residual harmful impurities—copper, nickel, chromium, tin, molybdenum, and others. The availability for blending of higher grade home (recirculating) scrap and prompt (process) scrap is declining as steelmaking and manufacturing process efficiency improves. Thus, prices for pig iron and DRI are expected to control prices of high residual scrap.

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 1997, increasing nearly 9% since 1996.

As the number of domestic minimills increased during the past two decades to satisfy demand by manufacturers for high-quality steel products, the emphasis by scrap suppliers to improve the quality of scrap offered to these steel mills has also grown. Electric steelmaking will require increasingly higher quality scrap and alternative iron sources to blend with lower quality scrap. 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, often in the form of long-term contracts, will increase in order to provide the best quality scrap requested for specific uses. The larger steelmakers may take more control of their scrap or scrap substitute supply sources by purchasing or starting operations that provide these raw materials. Increasingly, scrap suppliers are becoming certified in quality-assurance programs. Since 1987, when the International Organization for Standardization (ISO) first published its ISO-9000 standards, nearly 20 scrap companies have achieved registration, with as many as 100 more in the process of obtaining it. The ISO-9000 and ISO-9002 programs are concerned with product quality, and the ISO-14000 program is designed to avoid environmental damage.

In the United States, the primary source of obsolete steel is the automobile. Of the more than 13 million tons of steel recycled from automobiles in 1997, 1.8 million tons was recycled into new cars (Steel Recycling Institute, 1997). During 1997, the recycling rate of automobiles was nearly 98%. Because virtually all automobiles produced are eventually scrapped and recycled, the rate is not expected to change significantly. The recycling rate of obsolete appliance scrap has increased to 81% in 1997 from 2% in 1988. The typical appliance consists of about 75% steel, and from 25% to 100% of the steel used in appliances is recycled. The recycling rate of steel cans has increased to nearly 61% in 1997 from 15% in 1988. The recycling rate of steel from demolition sites now exceeds 90%. The recycling rates of appliance, can, and construction steel are expected to increase not only in the United States, but also in emerging industrial countries. As environmental regulations increase, recycling becomes more profitable and convenient, and public interest in recycling continues to increase.

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[1]Prior 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)

		1993	1994	1995	1996	1997
Manufacturers of pig iron and raw steel and castings: 2/						
Ferrous scrap consumption		53,000	54,000	56,000	56,000	58,000
Pig iron consumption		48,000	50,000	51,000	50,000	51,000
Direct-reduced iron consumption		1,500	1,500	1,500	1,300	1,300
Net receipts of ferrous scrap 3/		37,000	40,000	42,000	41,000	44,000
Home scrap production 4/		16,000	14,000	15,000	15,000	14,000
Ending stocks of ferrous scrap, December 31		3,200	3,600	3,700	4,800	5,000
Manufacturers of steel castings: 5/						
Ferrous scrap consumption		1,900	2,000	2,000	2,000 r/	1,800
Pig iron consumption		9	10	10	11	13
Net receipts of ferrous scrap 3/		1,300	1,400	1,300	1,300 r/	1,200
Home scrap production 4/		610	660	680	640	660
Ending stocks of ferrous scrap, December 31		85 r/	95	93	86 r/	78
Iron foundries and miscellaneous users: 5/						
Ferrous scrap consumption		13,000	13,000 r/	13,000	13,000	13,000
Pig iron consumption		670	1,000	1,100	1,100	1,200
Direct-reduced iron consumption		3	2	W	W	13
Net receipts of ferrous scrap 3/		7,900	8,300 r/	8,300	8,300	8,200
Home scrap production 4/		4,600	5,100	4,900	4,900	5,200
Ending stocks of ferrous scrap, December 31		370	370	390	360	470
Totals, all manufacturing types:						
Ferrous scrap consumption		68,000	70,000	72,000	71,000 r/	73,000
Pig iron consumption		49,000	51,000	52,000	52,000	52,000
Direct-reduced iron consumption		1,500	1,500	1,500	1,300	1,300
Net receipts of ferrous scrap 3/		46,000	50,000	51,000	50,000 r/	53,000
Home scrap production 4/		22,000	20,000	20,000	20,000	20,000
Ending stocks, December 31:						
Ferrous scrap at consumer plants		3,700	4,100	4,200	5,200	5,500
Pig iron at consumer and supplier plants		220	400	620	600	510
Direct-reduced iron at consumer plants		200	240	190	270	160
Exports: 6/						
Ferrous scrap (includes tinplate and terneplate) 7/		9,810	8,810	10,400	8,440	8,930
Value	thousands	$1,320,000	$1,270,000	$1,700,000	$1,340,000	$1,350,000
Pig iron (all grades)		27	56	54	58 r/	86
Value	thousands	$3,040	$6,780	$6,450	$8,320 r/	$12,300
Direct-reduced iron (steelmaking grade)		17	17	5	3	8
Value	thousands	$1,860	$1,850	$490	$304	$852
Imports for consumption: 6/						
Ferrous scrap (includes tinplate and terneplate) 7/		1,390	1,740	2,090	2,600	2,870
Value	thousands	$162,000	$218,000	$284,000	$342,000	$384,000
Pig iron (all grades)		828	2,500	2,360	2,660 r/	3,150
Value	thousands	$117,000	$344,000	$391,000	$411,000 r/	$465,000
Direct-reduced iron (steelmaking grade)		1,090	1,170	1,190	1,050	987
Value	thousands	$104,000	$138,000	$145,000	$136,000	$127,000

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 owing 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 1997, BY GRADE 1/

(Thousand metric tons)

Grade	Receipts of scrap		Production of home scrap		Consumption of both purchased and home scrap	Shipments of scrap	Ending stocks, December 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	380	--	2	--	370	17	25
Cut structural and plate	3,700	30	680	51	4,400	35	310
No. 1 heavy melting steel	6,500	310	3,800	15	11,000	160	740
No. 2 heavy melting steel	5,500	110	740	3	6,000	6	640
No. 1 and electric furnace bundles	5,300	430	1,400	(3/)	6,700	530	390
No. 2 and all other bundles	1,200	29	1	(3/)	1,200	--	75
Electric furnace, 1 foot and under (not bundles)	13	11	160	--	160	19	(3/)
Railroad rails	140	--	42	--	180	3	8
Turnings and borings	2,000	120	64	(3/)	2,200	(3/)	120
Slag scrap	720	170	1,300	--	2,100	210	180
Shredded or fragmentized	7,700	1,100	330	--	9,200	9	570
No. 1 busheling	4,200	120	130	--	4,200	59	310
Steel cans (post consumer)	330	17	260	--	620	--	73
All other carbon steel scrap	2,600	50	2,900	4	5,200	410	360
Stainless steel scrap	710	10	430	--	1,200	3	62
Alloy steel (except stainless)	300	6	660	--	930	8	110
Ingot mold and stool scrap	8	--	120	83	93	120	20
Machinery and cupola cast iron	62	--	4	--	60	2	5
Cast-iron borings	220	--	(3/)	--	220	(3/)	16
Motor blocks	8	--	--	--	(4/)	--	(4/)
Other iron scrap	360	52	480	(3/)	910	170	370
Other mixed scrap	940	(3/)	620	--	1,500	100	610
Total	43,000	2,500	14,000	160	58,000	1,900	5,000
Manufacturers of steel castings:							
Carbon steel:							
Low-phosphorus plate and punchings	360	1	62	(3/)	420	2	15
Cut structural and plate	170	--	5	(3/)	180	(3/)	10
No. 1 heavy melting steel	80	16	48	--	140	--	9
No. 2 heavy melting steel	16	--	13	--	27	--	2
No. 1 and electric furnace bundles	25	--	--	--	29	--	(3/)
No. 2 and all other bundles	--	--	--	--	--	--	--
Electric furnace, 1 foot and under (not bundles)	27	8	53	--	83	2	6
Railroad rails	42	--	1	--	42	--	2
Turnings and borings	33	--	5	--	38	--	(3/)
Slag scrap	--	--	4	--	4	--	(3/)
Shredded or fragmentized	66	--	--	--	65	--	2
No. 1 busheling	74	--	7	--	79	--	5
Steel cans (post consumer)	3	--	(3/)	--	3	--	(3/)
All other carbon steel scrap	74	(3/)	330	2	410	(3/)	5
Stainless steel scrap	32	(3/)	37	(3/)	67	2	5
Alloy steel (except stainless)	74	(3/)	59	--	140	(3/)	9
Ingot mold and stool scrap	10	--	--	(3/)	9	(3/)	1
Machinery and cupola cast iron	--	--	(3/)	--	(3/)	--	(3/)
Cast-iron borings	--	--	1	--	1	--	(3/)
Motor blocks	1	--	--	--	1	--	(3/)
Other iron scrap	10	--	9	(3/)	18	1	2
Other mixed scrap	37	--	2	14	52	1	3
Total	1,100	25	640	16	1,800	8	78

See footnotes at end of table.

TABLE 2--Continued
U.S. CONSUMER RECEIPTS, PRODUCTION, CONSUMPTION, SHIPMENTS, AND STOCKS
OF IRON AND STEEL SCRAP IN 1997, BY GRADE 1/

(Thousand metric tons)

Grade	Receipts of scrap		Production of home scrap		Consumption of both purchased and home scrap	Shipments of scrap	Ending stocks, December 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	920	5	130	(3/)	1,000	2	19
Cut structural and plate	1,300	54	110	(3/)	1,500	(3/)	130
No. 1 heavy melting steel	270	4	22	(3/)	290	2	10
No. 2 heavy melting steel	150	(3/)	--	--	150	--	4
No. 1 and electric furnace bundles	95	140	32	--	260	--	12
No. 2 and all other bundles	140	--	1	--	140	1	4
Electric furnace, 1 foot and under (not bundles)	140	1	12	--	150	1	3
Railroad rails	160	--	9	(3/)	170	--	8
Turnings and borings	92	65	3	--	160	4	3
Slag scrap	64	--	3	--	57	3	10
Shredded or fragmentized	1,400	95	(3/)	--	1,500	--	56
No. 1 busheling	850	62	39	--	910	38	22
Steel cans (post consumer)	14	--	--	--	14	--	(3/)
All other carbon steel scrap	140	(3/)	10	--	150	(3/)	4
Stainless steel scrap	4	--	5	(3/)	8	(3/)	1
Alloy steel (except stainless)	12	--	1	--	13	--	2
Ingot mold and stool scrap	94	--	100	--	200	(3/)	12
Machinery and cupola cast iron	790	7	290	2	1,100	2	68
Cast-iron borings	280	86	36	1	390	9	6
Motor blocks	290	9	730	--	1,000	3	18
Other iron scrap	260	2	3,500	4	3,800	7	61
Other mixed scrap	270	6	160	5	450	1	11
Total	7,700	530	5,200	11	13,000	72	470
Totals for all manufacturing types:							
Carbon steel:							
Low-phosphorus plate and punchings	1,700	6	190	(3/)	1,800	20	59
Cut structural and plate	5,200	85	800	51	6,100	35	450
No. 1 heavy melting steel	6,900	330	3,800	15	11,000	160	760
No. 2 heavy melting steel	5,600	110	750	3	6,200	6	640
No. 1 and electric furnace bundles	5,400	560	1,500	(3/)	7,000	530	400
No. 2 and all other bundles	1,300	29	3	(3/)	1,300	1	79
Electric furnace, 1 foot and under (not bundles)	180	19	230	--	400	22	9
Railroad rails	350	--	52	(3/)	390	3	18
Turnings and borings	2,100	180	72	(3/)	2,400	4	120
Slag scrap	790	170	1,300	--	2,200	210	190
Shredded or fragmentized	9,200	1,200	330	--	11,000	9	630
No. 1 busheling	5,100	180	180	--	5,200	97	340
Steel cans (post consumer)	350	17	260	--	640	--	74
All other carbon steel scrap	2,800	50	3,200	6	5,700	410	370
Stainless steel scrap	750	10	470	(3/)	1,200	5	68
Alloy steel (except stainless)	390	6	720	--	1,100	8	120
Ingot mold and stool scrap	110	--	230	83	300	120	33
Machinery and cupola cast iron	850	7	290	2	1,100	3	72
Cast-iron borings	500	86	38	1	610	9	23
Motor blocks	300	9	730	--	1,000	3	18
Other iron scrap	640	54	4,000	4	4,700	180	430
Other mixed scrap	1,300	6	780	19	2,000	100	620
Total	52,000	3,100	20,000	180	73,000	1,900	5,500

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 1997 1/

(Thousand metric tons)

	Receipts	Production	Consumption	Shipments	Stocks, December 31
Manufacturers of pig iron, raw steel, and castings:					
Pig iron	5,900 2/	49,000	51,000	2,700	440
Direct-reduced iron	1,100 3/	--	1,300	10	160
Manufacturers of steel castings:					
Pig iron	13	(4/)	13	--	(4/)
Direct-reduced iron	--	--	--	--	--
Iron foundries and miscellaneous users:					
Pig iron	1,200	(4/)	1,200	17	(4/)
Direct-reduced iron	17	--	W	W	W
Totals for all manufacturing types:					
Pig iron	7,100	49,000	52,000	2,700	510
Direct-reduced iron	1,100	--	1,300	10	160

W Withheld to avoid disclosing company proprietary data.
1/ Data are rounded to two significant digits; may not add to totals shown.
2/ Includes 1,700 tons purchased by electric furnace steel producers.
3/ Includes 370 tons purchased by integrated steel producers.
4/ Withheld to avoid disclosing company proprietary data; included in "Total."

TABLE 4
U.S. CONSUMPTION OF IRON AND STEEL SCRAP, PIG IRON, AND DIRECT-REDUCED IRON (DRI) IN 1997,
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	--	370	--	--	--	--	--	--	1,700	--	370
Basic oxygen process	16,000	50,000	130	--	--	--	--	--	--	16,000	50,000	130
Electric furnace	41,000	1,600	790	1,700	13	--	6,900	770	--	49,000	2,400	790
Cupola furnace	W	--	--	W	1	--	6,500	400	13	6,600	400	13
Other (including air furnaces)	W	--	--	W	--	--	(2/)	(2/)	--	7	(2/)	--
Direct castings 3/	--	41	--	--	--	--	--	--	--	--	41	--
Total	58,000	51,000	1,300	1,800	13	--	13,000	1,200	13	73,000	52,000	1,300

W Withheld to avoid disclosing company proprietary data; included in "Total."
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 AVAILABLE FOR CONSUMPTION IN 1997, BY REGION AND STATE 1/ 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	47	7	27	(5/)	(5/)	81
New Jersey and New York	1,800	--	110	--	3	1,900
Pennsylvania	5,100	120	2,600	80	96	7,800
Total	6,900	120	2,800	80	99	9,800
North Central:						
Illinois	4,300	95	1,400	6	160	5,700
Indiana	4,200	150	5,000	38	600	8,800
Iowa, Nebraska, South Dakota	1,600	W	220	--	W	1,800
Kansas and Missouri	1,100	4	170	--	(5/)	1,300
Michigan	3,200	430	2,100	4	120	5,600
Minnesota	460	W	120	(5/)	W	740
Ohio	6,700	1,000	2,400	21	690	9,500
Wisconsin	1,200	--	1,000	(5/)	2	2,200
Total	23,000	1,900	12,000	70	1,600	36,000
South Atlantic:						
Delaware and Maryland	630	1	W	--	W	1,100
Florida and Georgia	1,100	--	W	--	W	1,200
North Carolina and South Carolina	1,300	--	W	--	W	1,500
Virginia and West Virginia	1,400	140	530	W	W	2,000
Total	4,400	140	1,300	W	110	5,800
South Central:						
Alabama and Mississippi	2,700	W	850	7	W	3,600
Arkansas, Louisiana, Oklahoma	4,500	W	280	W	5	4,900
Kentucky and Tennessee	2,400	2	610	W	W	3,000
Texas	3,600	890	760	6	8	5,300
Total	13,000	980	2,500	25	89	17,000
Mountain and Pacific:						
Arizona, Colorado, Idaho, Montana, Utah	2,100	(5/)	660	W	(6/)	2,800
California, Oregon, Washington	2,100	(6/)	270	1	10	2,400
Total	4,300	(6/)	930	W	10	5,200
Grand total	52,000	3,100	20,000	180	1,900	73,000

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.

6/ Withheld to avoid disclosing company proprietary data.

TABLE 6
U.S. CONSUMPTION OF IRON AND STEEL SCRAP AND PIG IRON IN 1997, BY REGION AND STATE 1/ 2/ 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	1,600	24	17	(4/)	410	18	2,000	42
Pennsylvania	7,200	2,700	220	5	650	85	8,100	2,800
Total	8,800	2,700	230	5	1,100	100	10,000	2,800
North Central:								
Illinois	4,900	2,900	81	1	580	36	5,600	2,900
Indiana	7,700	18,000	89	1	1,400	170	9,200	18,000
Iowa, Kansas, Minnesota, Missouri, Nebraska, South Dakota, Wisconsin	2,400	4	450	2	2,600	340	5,500	350
Michigan	2,800	5,200	38	(4/)	2,700	130	5,500	5,300
Ohio	8,100	10,000	340	2	1,300	140	9,700	10,000
Total	26,000	36,000	1,000	7	8,400	820	35,000	37,000
South Atlantic:								
Delaware, Maryland, Virginia, West Virginia	2,500	W	W	W	570	23	3,100	4,700
Florida, Georgia, North Carolina, South Carolina	2,200	W	W	W	510	39	2,700	110
Total	4,700	4,800	6	1	1,100	61	5,800	4,800
South Central:								
Alabama, Kentucky, Mississippi, Tennessee	4,400	W	300	W	1,800	W	6,600	4,700
Arkansas, Louisiana, Oklahoma	4,700	W	27	W	130	W	4,900	680
Texas	4,700	200	90	W	490	49	5,200	250
Total	14,000	5,500	420	W	2,500	180	17,000	5,700
Mountain and Pacific:								
Arizona, Colorado, Idaho, Montana, Utah	2,500	W	20	(4/)	120	W	2,700	2,200
California, Oregon, Washington	2,100	W	130	(4/)	220	W	2,400	46
Total	4,600	2,200	150	(4/)	340	8	5,100	2,200
Grand total	58,000	51,000	1,800	13	13,000	1,200	73,000	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, 1997,
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	(5/)	(5/)	W	W	2	1
New Jersey and New York	64	2	1	W	W	69	1
Pennsylvania	320	46	41	31	9	450	6
Total	380	48	42	34	10	520	8
North Central:							
Illinois	510	W	W	10	1	520	13
Indiana	480	W	W	110	13	610	210
Iowa, Kansas, Missouri, Nebraska, South Dakota	180	(5/)	W	13	W	200	9
Michigan	190	(5/)	1	20	40	250	15
Minnesota and Wisconsin	48	2	(5/)	10	W	61	17
Ohio	410	11	52	39	15	520	40
Total	1,800	18	60	200	71	2,200	310
South Atlantic:							
Delaware, Maryland, Virginia, West Virginia	190	W	W	12	4	210	W
Florida, Georgia, North Carolina, South Carolina	110	W	W	28	3	140	W
Total	300	W	W	40	8	360	72
South Central:							
Alabama, Kentucky, Mississippi, Tennessee	510	(5/)	W	270	W	1,300	W
Arkansas, Louisiana, Oklahoma	480	(5/)	W	9	W	490	W
Texas	320	(5/)	W	17	W	350	10
Total	1,300	1	14	290	490	2,100	99
Mountain and Pacific:							
Arizona, Colorado, Idaho, Montana, Utah	220	(5/)	W	3	--	220	W
California, Oregon, Washington	92	W	W	5	49	150	W
Total	310	W	W	8	49	380	26
Grand total	4,100	68	120	570	620	5,500	510

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 1/

(Dollars per metric ton)

Period	Chicago	Philadelphia	Pittsburgh	Composite price
1997:				
January	129.07	118.91	128.30	125.43
February	141.23	119.09	135.44	131.92
March	137.49	115.20	127.45	126.72
April	130.50	113.36	122.55	121.80
May	134.34	120.31	129.42	128.03
June	134.34	122.42	129.42	128.73
July	141.23	126.96	133.36	133.85
August	144.19	126.96	135.33	135.49
September	137.39	124.01	128.44	129.95
October	137.42	124.27	131.69	131.13
November	140.25	129.91	138.28	136.15
December	140.25	129.91	138.28	136.15
Annual average:				
1997	137.31	122.61	131.50	130.45
1996	133.92	122.77	135.11	130.60

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, BY COUNTRY 1/ 2/

(Thousand metric tons and thousand dollars)

	1996		1997	
Country	Quantity	Value	Quantity	Value
Belgium	4	2,460	3	1,930
Canada	1,250	170,000	1,490	193,000
China	247	50,300	234	46,500
Colombia	9	1,070	17	1,630
Germany	6	1,080	2	698
Greece	(3/)	16	(3/)	22
Hong Kong	88	22,800	93	22,800
India	418	58,800	111	17,400
Indonesia	28	4,300	105	12,700
Italy	8	6,530	9	3,140
Japan	157	45,800	101	20,700
Korea, Republic of	2,590	391,000	3,190	484,000
Malaysia	607	77,000	313	38,400
Mexico	1,190	158,000	1,760	230,000
Netherlands	4	2,330	5	2,720
Pakistan	2	1,390	2	466
Peru	--	--	(3/)	31
Philippines	90	12,500	58	9,410
Singapore	4	2,430	--	--
South Africa	13	11,400	17	10,800
Spain	65	49,900	60	44,400
Sweden	9	8,630	4	2,760
Taiwan	316	69,500	576	95,200
Thailand	175	23,300	124	17,800
Turkey	852	113,000	555	68,800
United Kingdom	4	3,060	8	4,890
Venezuela	265	47,400	54	5,540
Other	44	10,100	42	9,970
Total	8,440	1,340,000	8,930	1,350,000

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 United States exported scrap to 73 countries in 1996 and 71 countries in 1997.
3/ Less than 1/2 unit.

Source: Bureau of the Census.

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

(Thousand metric tons and thousand dollars)

Customs district	1996		1997	
	Quantity	Value	Quantity	Value
Boston, MA	572	76,600	633	77,400
Buffalo, NY	88	32,800	177	41,900
Chicago, IL	4	907	(3/)	16
Cleveland, OH	(3/)	75	(3/)	26
Columbia - Snake	107	21,800	118	19,900
Detroit, MI	256	43,700	303	47,800
Honolulu, HI	95	13,900	124	17,200
Houston-Galveston, TX	53	34,300	87	43,800
Laredo, TX	570	72,400	914	119,000
Los Angeles, CA	1,180	205,000	1,320	215,000
Miami, FL	127	20,800	49	7,670
New Orleans, LA	172	62,200	74	56,900
New York, NY	1,170	178,000	1,320	199,000
Norfolk, VA	211	27,500	123	15,200
Pembina, ND	263	29,900	332	33,900
Philadelphia, PA	279	34,400	321	37,300
Portland, ME	164	20,500	61	7,510
Providence, RI	363	46,400	370	44,800
San Francisco, CA	1,050	184,000	945	153,000
Seattle, WA	390	60,100	387	60,700
Tampa, FL	343	45,000	280	36,300
Other	990	135,000	1,000	113,000
Total	8,440	1,340,000	8,930	1,350,000

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	1996		1997	
	Quantity	Value	Quantity	Value
No. 1 heavy melting scrap	1,920	246,000	1,820	230,000
No. 2 heavy melting scrap	508	61,800	448	52,200
No. 1 bundles	110	13,500	91	10,700
No. 2 bundles	126	14,200	142	14,200
Shredded steel scrap	2,720	370,000	2,450	327,000
Borings, shovelings and turnings	254	25,800	291	26,600
Cut plate and structural	559	73,500	759	101,000
Tinned iron or steel	51	18,700	79	21,600
Remelting scrap ingots	3	781	2	933
Stainless steel scrap	303	234,000	370	231,000
Other alloy steel scrap	674	123,000	962	144,000
Other steel scrap 3/	598	95,300	692	92,500
Iron scrap	627	68,700	823	94,200
Total	8,440	1,340,000	8,930	1,350,000
Ships, boats, and other vessels for scrapping	24	2,710	39	4,580
Used rails for rerolling and other uses 4/	21	6,900	43	17,200
Total exports	8,490	1,350,000	9,010	1,370,000

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	1996		1997	
	Quantity	Value	Quantity	Value
Bahamas, The	1	85	(3/)	4
Belgium	(3/)	24	33	4,100
Brazil	8	1,670	16	1,180
Canada	1,910	247,000	2,070	269,000
China	1	1,260	2	1,720
Colombia	(3/)	18	--	--
Costa Rica	1	91	(3/)	85
Dominican Republic	5	884	10	1,030
France	(3/)	56	(3/)	146
Germany	75	10,800	1	1,650
Israel	(3/)	255	--	--
Jamaica	4	483	4	339
Japan	51	8,230	50	6,980
Korea, Republic of	(3/)	29	--	--
Martinique	1	64	--	--
Mexico	114	27,600	171	31,300
Netherlands	3	3,100	35	4,610
Panama	12	1,930	3	533
Peru	31	450	(3/)	30
Philippines	(3/)	6	--	--
Poland	--	--	23	4,390
Russia	(3/)	76	(3/)	252
Singapore	(3/)	111	--	--
South Africa	36	3,300	--	--
Switzerland	(3/)	70	2	67
Trinidad and Tobago	16	712	(3/)	11
United Kingdom	69	8,330	336	47,600
Venezuela	262	24,600	68	4,580
Other	1	1,250	44	4,310
Total	2,600	342,000	2,870	384,000

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 United States imported scrap from 49 countries in 1996 and from 57 countries in 1997.
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	1996		1997	
	Quantity	Value	Quantity	Value
Baltimore, MD	22	1,430	33	2,210
Buffalo, NY	418	63,400	394	61,200
Charleston, SC	71	9,250	12	1,450
Chicago, IL	17	2,760	103	9,690
Cleveland, OH	67	6,480	90	9,300
Detroit, MI	1,200	145,000	1,100	145,000
El Paso, TX	45	6,240	44	5,470
Laredo, TX	49	16,400	106	20,400
New Orleans, LA	208	24,500	480	65,000
New York, NY	(3/)	677	19	2,040
Ogdensburg, NY	15	4,020	20	4,970
Pembina, ND	12	2,950	23	4,950
San Diego, CA	22	5,590	13	4,900
Seattle, WA	392	40,900	394	40,500
Other	67	12,600	32	7,130
Total	2,600	342,000	2,870	384,000

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	1996		1997	
	Quantity	Value	Quantity	Value
No. 1 heavy melting scrap	112	13,200	122	15,100
No. 2 heavy melting scrap	22	2,650	19	2,100
No. 1 bundles	233	27,500	270	33,600
No. 2 bundles	18	2,140	42	5,640
Shredded steel scrap	84	11,200	325	44,200
Borings, shovelings and turnings	121	12,000	127	13,300
Cut plate and structural	164	14,300	68	6,670
Tinned iron or steel	65	5,690	34	5,120
Remelting scrap ingots	82	12,900	53	5,270
Stainless steel scrap	51	28,500	64	33,700
Other alloy steel scrap	345	48,300	373	49,600
Other steel scrap 3/	1,100	137,000	1,150	142,000
Iron scrap	210	27,000	216	27,700
Total	2,600	342,000	2,870	384,000
Ships, boats, and other vessels for scrapping	(4/)	90	(4/)	43
Used rails for rerolling and other uses 5/	248	43,400	328	63,000
Total imports	2,850	386,000	3,190	447,000

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	1996 Quantity (metric tons)	1996 Value (thousands)	1997 Quantity (metric tons)	1997 Value (thousands)
Bahamas, The	1	$4	850	$283
Brazil	54	70	--	--
Canada	7,040	2,890	8,030	2,340
Chile	102	102	79	125
Dominican Republic	372	111	--	--
Malaysia	17	9	--	--
Mexico	12,400	2,830	30,300	9,880
Peru	323	148	5	26
Venezuela	45	31	1,230	1,100
Other	962 r/	704 r/	2,730	3,420
Total	21,300	6,900	43,200	17,200

r/ Revised.
1/ Data are rounded to three significant digits; may not add to totals shown.
2/ Exports contain mixed (used plus new) rails totaling 4,760 metric tons valued at $2,680,000 in 1996 and 8,890 metric tons valued at $8,380,000 in 1997. 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	1996 Quantity (metric tons)	1996 Value (thousands)	1997 Quantity (metric tons)	1997 Value (thousands)
Australia	60	$28	--	--
Canada	89,200	21,600	131,000	$34,800
Germany	32	52	722	332
Italy	57	173	--	--
Japan	278	204	35	32
Liberia	--	--	6,350	582
Poland	32,200	5,370	15,000	2,010
Russia	126,000	15,100	165,000	24,200
Slovakia	328	806	--	--
Ukraine	--	--	9,500	997
Other	16	105	18	48
Total	248,000	43,400	328,000	63,000

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	1996 Quantity (metric tons)	1996 Value (thousands)	1997 Quantity (metric tons)	1997 Value (thousands)
Argentina	--	--	34	$4
Australia	1,270	$134	1,310	$138
Canada	22	3	--	--
Colombia	397	42	40	4
Germany	30	3	252	29
Italy	59	6	--	--
Indonesia	--	--	1,150	105
Japan	--	--	36	4
Korea, Republic of	321	34	1,230	130
Mexico	161	17	187	20
Netherlands	296	31	2,440	259
Other	326	34	1,410	159
Total	2,880	304	8,100	852

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	1996 Quantity (metric tons)	1996 Value (thousands)	1997 Quantity (metric tons)	1997 Value (thousands)
Canada	117	$17	331	$41
South Africa	--	--	11,400	1,300
Spain	--	--	42,400	5,860
Sweden	995	105	--	--
Ukraine	35,900	4,710	--	--
Venezuela	1,010,000	131,000	933,000	120,000
Total	1,050,000	136,000	987,000	127,000

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	1996 Quantity (metric tons)	1996 Value (thousands)	1997 Quantity (metric tons)	1997 Value (thousands)
Australia	3,140	$276	12	$3
Brazil	--	--	251	22
Canada	15,700 r/	2,980 r/	26,700	5,090
China	364	32	2,230	230
Hong Kong	150 r/	13 r/	1,150	102
Japan	1,230	112	1,280	113
Korea, Republic of	--	--	154	14
Mexico	30,100 r/	4,240 r/	30,900	4,200
Netherlands	--	--	111	10
Saudi Arabia	--	--	1,070	95
Taiwan	1,090 r/	114 r/	19,100	2,100
United Kingdom	1,150 r/	135 r/	30	3
Venezuela	2,770 r/	253	396	86
Other	1,790 r/	163 r/	2,630	272
Total	57,600 r/	8,320 r/	85,900	12,300

r/ Revised.
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% phosphorus content, greater than 0.5% 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	1996 Quantity (metric tons)	1996 Value (thousands)	1997 Quantity (metric tons)	1997 Value (thousands)
Argentina	27,400	$3,750	61,800	$8,790
Brazil	1,730,000 r/	267,000 r/	1,670,000	246,000
Canada	111,000 r/	25,000 r/	117,000	26,700
China	21,500 r/	3,010 r/	60,100	8,610
Estonia	--	--	70,200	10,400
France	20,700	2,860	--	--
Germany	39,600	5,210	--	--
India	--	--	25,300	3,620
Italy	--	--	5,140	898
Japan	35,500	4,990	--	--
Latvia	10,000	1,430	--	--
Norway	3,000	532	--	--
Poland	--	--	14,700	2,340
Russia	275,000 r/	38,100 r/	576,000	78,900
South Africa	113,000	20,300 r/	106,000	17,400
Switzerland	--	--	114,000	16,000
Turkey	40,000	6,130	--	--
Ukraine	197,000 r/	28,500 r/	231,000	32,800
Venezuela	36,000	4,980	105,000	12,800
Other	--	--	3	4
Total	2,660,000 r/	411,000 r/	3,150,000	465,000

r/ Revised.
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% phosphorus content, greater than 0.5% phosphorus content, and alloy grade. Import valuation is customs value.

Source: Bureau of the Census.