



2018 Minerals Yearbook

IRON AND STEEL [ADVANCE RELEASE]

IRON AND STEEL

By Candice C. Tuck

Domestic survey data and tables were prepared by Hoa P. Phamdang, statistical assistant.

In 2018, U.S. raw steel production increased to 86.6 million metric tons (Mt), an increase of 6% from 81.6 Mt in 2017. Of the 86.6 Mt, carbon steel accounted for 79.1 Mt, stainless steel accounted for 2.81 Mt, and other alloy steels accounted for 4.74 Mt. The domestic industry utilized 78.2% of the raw steel production capacity. Exports of steel mill products decreased by 16% to 7.98 Mt in 2018 from 9.55 Mt in 2017, and imports decreased by 12% to 30.6 Mt in 2018 from 34.6 Mt in 2017. Among raw materials, pig iron production increased by 7% to 24.1 Mt from 22.4 Mt in 2017, and direct-reduced iron production increased by 12% to 3.35 Mt from 2.99 Mt in 2017 (table 1).

World production of raw steel increased by 7% to 1,810 Mt in 2018 from 1,690 Mt in 2017. In 2018, global production of pig iron increased by 5% to 1,250 Mt from 1,180 Mt in 2017. Global production of direct-reduced iron increased by 3% to 93.6 Mt from 90.9 Mt in 2017 (table 1). In 2018, global steelmaking capacity decreased for the third year in a row, following at least 10 years in increases, to 2,234 million metric tons per year (Mt/yr), a slight decrease from 2,251 Mt/yr in 2017 and from 2,281 Mt/yr in 2016. Global capacity utilization increased to 80.3% in 2018 from 75.0% in 2017 and 71.3% in 2016 as capacity decreased and production increased (Organisation for Economic Co-operation and Development, undated).

Legislation and Government Programs

In March 2018, the President of the United States issued Proclamations 9704 and 9705 on Adjusting Imports of Steel and Aluminum into the United States, concluding investigations launched in April 2017 into whether dependence on steel imports constituted a national security threat conducted by the U.S. Department of Commerce (DOC) through the Presidential authority under section 232 of the Trade Expansion Act of 1962. The DOC determined steel imports were a national security threat and recommended imposing trade restrictions, such as quotas or tariffs, to modify import levels. The initial Presidential proclamations were announced in the Federal Register (83 FR 13355 and 83 FR 13361) and instituted a 25% ad valorem tariff on certain steel mill articles imported from all countries. (Executive Office of the President, 2018; U.S. Department of Homeland Security, undated).

Throughout the year, modifications and changes were made to the list of countries subject to the tariffs. For some countries, quotas were established in place of the additional duties, and exemptions for certain products were granted. Many countries responded to the increased import duties by increasing the duties for imports of steel articles of United States origin, including European Union countries, Canada, China, India, Japan, Mexico, Russia, and Turkey.

At yearend 2018, the additional import duty for steel articles remained at 25% for most countries of origin and was 50% for Turkey. The only countries that did not have the increased

import duty for steel were Argentina, Brazil, and the Republic of Korea, all of which had import quotas in place, and Australia.

Production

In 2018, U.S. raw steel production increased to 86.6 Mt, an increase of 6% from 81.6 Mt in 2017. The American Iron and Steel Institute (AISI) estimated raw steel production capacity in 2018 to be 111 Mt, essentially unchanged from 110 Mt in 2017. Production in 2018 accounted for 78.2% of capacity utilization compared with 74.0% in 2017. Integrated steel producers smelted iron ore to make liquid iron in blast furnaces and used basic oxygen furnaces (BOFs) to refine the liquid iron, with some steel scrap, to produce raw liquid steel. The BOF process was used to make 27.7 Mt of steel in the United States, a 7% increase from 25.8 Mt in 2017. The use of this process increased slightly to 32.0% of total steel production in 2018 from 31.6% in 2017 (American Iron and Steel Institute, 2019, p. 70–71, 73). Blast furnaces in the United States were operated by AK Steel Corp., ArcelorMittal USA, and U.S. Steel Corp. at nine locations in 2018 (Association for Iron and Steel Technology, 2018, p. 166–167).

Minimills and specialty mills are nonintegrated steel producers that use electric arc furnaces (EAFs) to melt low-cost raw materials (primarily scrap). They also employ continuous casting machines and hot-rolling mills that are often closely coupled to casting operations. Specialty mills include producers of electrical alloys, stainless, and tool steel; high-temperature alloys; forged ingots; and other low-volume steel products. During 2018, 51 companies operated 99 EAF facilities in the United States (Association for Iron and Steel Technology, 2018, p. 172–180). These mills accounted for 68.0% of total domestic steelmaking, a slight decrease from 68.4% in 2017, and produced 58.9 Mt of steel in 2018, a 6% increase from the 55.8 Mt produced in 2017. Raw liquid steel is mostly cast into semifinished products in continuous casting machines. Continuous casting production accounted for nearly all of the domestic steel production, or 86.4 Mt. Only 230,000 metric tons was produced in ingot form in 2018 (American Iron and Steel Institute, 2019, p. 71).

Consumption and Shipments

Steel products are delivered in a variety of intermediate forms as continuous casting products, such as bars, billets, and blooms, or in a variety of semifinished products, such as plates, rods, sheets, or wires, or finished steel products, such as nails, pipes, rebar, or tracks. Steel mill products are produced either by forging or by rolling into forms normally delivered for fabrication or use. Some companies purchase semifinished steel mill products directly from other steel companies and use them to produce finished steel products. The accumulated shipments

of all companies less the shipments to other reporting companies are identified as net shipments to avoid double counting.

U.S. apparent steel consumption (calculated as net steel shipments plus imports of finished steel mill products minus total exports of steel mill products plus adjustments for industry stock changes) was 101 Mt in 2018, a 9% decrease from 111 Mt in 2017. Since 2000, apparent steel consumption has ranged between a high of 120 Mt in 2006 and a low of 63 Mt in 2009. Net shipments of steel mill products by U.S. companies were 86.4 Mt, a 5% increase from 82.5 Mt in 2017 (table 1). Shipments of steel mill products by end use in 2018 were led by construction and contractors' products (24.6 Mt); automotive products (15.2 Mt); the oil and gas industry (2.58 Mt); appliances, utensils, and cutlery (2.44 Mt); containers, packaging, and shipping materials (1.60 Mt); machinery, industrial equipment, and tools (1.55 Mt); and rail transportation products (1.33 Mt). The largest year-on-year increases, by quantity, were in the construction, contractors' products, and automotive products (American Iron and Steel Institute, 2019, p. 27).

Prices

The Producer Price Index (PPI) program of the U.S. Bureau of Labor Statistics (2019) measures the average change over time in the selling prices received by domestic producers for their output. Exports are included and imports are excluded so that the output of U.S. producers may be valued. The PPI (1982=100) for steel mill products was 211.1 in 2018 and 187.4 in 2017 (table 1). The hot-rolled steel coil index (U.S. Midwest mills, free on board) at yearend 2018 was \$36.46 per hundredweight (\$729.20 per short ton), a 14% increase from \$32.07 per hundredweight (\$641.40 per short ton) at yearend 2017. The price for 1-inch round, cold-finished 1-1018 grade (carbon) steel bars at yearend 2018 was \$63.50 per hundredweight (\$1,270 per short ton), a 13% increase from \$56.00 per hundredweight (\$1,120 per short ton) at yearend 2017. The price for stainless steel coiled plate, grade 304, at yearend 2018 was \$110.00 per hundredweight (\$2,200 per short ton), nearly unchanged from \$110.50 per hundredweight (\$2,210 per short ton) at yearend 2017 (American Metal Market, 2017, p. 13; 2018, p. 10).

Foreign Trade

U.S. exports of steel mill products were 8.0 Mt, a 16% decrease from 9.6 Mt in 2017. Canada received 3.9 Mt of United States steel products, an 18% decrease from 4.7 Mt in 2017, followed by Mexico with 3.2 Mt, a 14% decrease from 3.7 Mt in 2017. Domestic imports of steel mill products were 30.6 Mt in 2018, a 12% decrease from 34.6 Mt in 2017. Canada was the leading source of imports accounting for 18% of all imports, followed by Brazil (13%), Mexico (11%), the European Union (10%) and the Republic of Korea (8%) (table 4).

Imports of semifinished steel by steel companies are taken into consideration when calculating apparent consumption (supply) of steel mill products in the United States and the share of the steel market represented by imported steel. To avoid double counting the imported semifinished steel and

the products produced from it, the amount of semifinished steel consumed by companies that also produced raw steel is subtracted from domestic consumption. In 2018, imports of semifinished steel were 7.3 Mt, and imports of finished steel mill products were 23.3 Mt. Taking the imported semifinished steel into consideration, the share of the U.S. steel market represented by imported steel was 28% in 2018, a decrease from 32% in 2017 (American Iron and Steel Institute, 2019, p. 23, 45).

World Review

World production of pig iron totaled 1,250 Mt, a 5% increase from 1,180 in 2017. China continued to be the leading producer of pig iron in the world, producing 771 Mt, which was 62% of the world total and an 8% increase from that of 2017, followed by Japan (77.3 Mt), India (71.5 Mt), Russia (51.7 Mt), the Republic of Korea (47.1 Mt), Brazil (28.7 Mt), Germany (27.3 Mt), and the United States (26.5 Mt) (table 9).

World capacity (operating, under construction, and under contract) for direct-reduced iron (DRI) production in 2018 was estimated to be about 133 Mt/yr, including about 13 Mt/yr of idled capacity. DRI production worldwide was estimated to have increased by 15% to 100 Mt in 2018 from 87 Mt in 2017. The leading producer of DRI was India (28 Mt), followed by Iran (26 Mt), Russia (7.9 Mt), Mexico (6.0 Mt), Saudi Arabia (6.0 Mt), and Egypt (5.2 Mt). In 2018, DRI capacity of about 13 Mt/yr was under construction in Algeria, Bolivia, Iran, the United States, and Venezuela. The leading technology was, according to declining order of production capacity, the Midrex process (92.7 Mt/yr), followed by HYL/Energiron (22.7 Mt/yr), rotary kiln (14.1 Mt/yr), and other technologies (3.2 Mt/yr) (Midrex Technologies, Inc., 2019, p. 2–7, 12–15).

World production of raw steel was 1,810 Mt, a 7% increase from 1,690 in 2017. Global steel production was led by China with 928 Mt, followed by India (106 Mt), Japan (104 Mt), the United States (86.6 Mt), the Republic of Korea (72.5 Mt), and Russia (71.7 Mt). These six countries accounted for 76% of all global production (table 10). Apparent steel use of finished steel products was led by China (48.8%), followed by other countries in Asia (10.0%), the European Union (9.9%), and North America (8.3%). The leading exporter of steel in 2018 was China with 68.8 Mt, followed by Japan (35.8 Mt), Russia (33.3 Mt), the Republic of Korea (30.1 Mt), and the European Union (28.4 Mt). The leading importer of steel in 2018 was the European Union with 44.9 Mt, followed by the United States (31.7 Mt), Germany (26.6 Mt), Italy (20.6 Mt), and Thailand (15.5 Mt). The leading global steel producers were ArcelorMittal S.A. (96.4 Mt), China Baowu Steel Group Corp., Ltd. (67.4 Mt), Nippon Steel and Sumitomo Metal Corp. Group (49.2 Mt), and Hesteel Group Co. Ltd. (46.8 Mt). The leading steel product exports in 2018, by quantity, were hot-rolled sheets and coils (79.0 Mt), ingots and semifinished products (62.0 Mt), galvanized sheet (44.7 Mt), steel tubes and fittings (41.3 Mt), and cold-rolled sheets and coils (35.7 Mt) (World Steel Association, 2019a, p. 8, 15, 25–27).

Outlook

The increase or decrease of gross domestic product (GDP), the broadest measure of a nation's economic activity, may be considered an indicator of the health of the steelmaking and steel manufacturing industries, worldwide and domestically. The World Bank's forecast of global GDP growth for 2019, 2020, and 2021 is 2.6%, 2.7%, and 2.8%, respectively, after 3.0% and 3.1% in 2018 and 2017, respectively. The rate of GDP growth for China was estimated to be 6.6% in 2018 and is projected to decrease to 6.2%, 6.1%, and 6.0% in 2019, 2020, and 2021, respectively. The rate of GDP growth for India is estimated to be 7.2% in 2018 and is projected to be 7.5% in 2019, 2020, and 2021 (World Bank, The, 2019, p. 4). The U.S. Federal Reserve's projections for the rate of GDP growth for the United States are 2.1% for 2019, 1.9% for 2020, and 1.8% for 2021 (Board of Governors of the Federal Reserve System, 2019).

According to the World Steel Association, world apparent steel consumption (ASC) was reported to be 1,712 Mt in 2018 and is forecast to increase slightly to 1,735 Mt in 2019 and 1,752 Mt in 2020. China's ASC is expected to increase to 843 Mt in 2019 and decrease to 835 Mt in 2020, from 835 Mt in 2018. The ASC in India is expected to increase to 102.8 Mt in 2019 and 110 Mt in 2020, from 96.0 Mt in 2018. Increases in ASC in 2019 from 2018 are also anticipated in the Commonwealth of Independent States (to 57.0 Mt from 56.2 Mt), the European Union (to 170.2 Mt from 169.7 Mt), and the United States (to 101.4 Mt from 100.2 Mt). Japan's ASC is forecast to decrease to 64.7 Mt in 2019 from 65.4 Mt in 2018 (World Steel Association, 2019a, p. 16; 2019b).

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TABLE 1
SALIENT IRON AND STEEL STATISTICS¹

(Thousand metric tons unless otherwise noted)

	2014	2015	2016	2017	2018
United States:					
Pig iron: ²					
Production	29,400	25,400	22,300	22,400	24,100
Exports	7	17	37	37	14
Imports for consumption	4,600	4,530	3,870	5,130	6,020
Direct-reduced iron:					
Production ³	1,300	1,100	1,810	2,990	3,350
Exports ⁴	1	20	178	640	551
Imports for consumption ⁴	2,390	1,860	1,600	1,790	1,750
Raw steel production: ⁵					
Carbon steel	81,400	73,600	73,200	75,700	79,100
Stainless steel	2,390	2,350	2,480	2,750	2,810
All other alloy steel	4,420	2,930	2,820	3,170	4,740
Total	88,200	78,800	78,500	81,600	86,600
Capacity utilization, percent	77.5	70.1	70.5	74.0	78.2
Steel mill products:					
Net shipments ²	89,100	78,500	78,500	82,500	86,400
Exports ²	10,900	9,050	8,450	9,550	7,980
Imports ²	40,200	35,200	30,000	34,600	30,600
Producer Price Index (1982=100.0) ⁶	200.2	177.1	167.8	187.4	211.1
World production:					
Pig iron	1,190,000	1,160,000	1,170,000 ^r	1,180,000	1,250,000
Direct-reduced iron ³	79,800 ^r	76,000 ^r	79,000 ^r	90,900 ^r	93,600
Raw steel	1,670,000	1,620,000	1,630,000	1,690,000	1,810,000

^rRevised.

¹Table includes data available through January 30, 2020. Data are rounded to no more than three significant digits, except Producer Price Index; may not add to totals shown.

²Source: American Iron and Steel Institute (AISI).

³Sources: Midrex Technologies, Inc., foreign governments, and producing companies.

⁴Source: U.S. Census Bureau.

⁵Raw steel is defined by AISI as steel in the first solid state after melting, suitable for rolling.

⁶Source: U.S. Bureau of Labor Statistics.

TABLE 2
MATERIALS CONSUMED IN BLAST FURNACES AND
PIG IRON PRODUCED¹

(Thousand metric tons)

Material	2017	2018
Iron oxides: ²		
Pellets	28,900	30,800
Sinter ³	4,190	4,530
Total	33,100	35,300
Scrap ⁴	1,480	1,550
Coke ²	7,120	7,640
Pig iron, produced ²	22,400	24,100

¹Table includes data available through January 30, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

²Source: American Iron and Steel Institute.

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

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

TABLE 3
DISTRIBUTION OF SHIPMENTS OF STEEL MILL PRODUCTS, BY STEEL TYPE, PRODUCT,
AND MARKET¹

	Quantity (thousand metric tons)		Percent of total	
	2017	2018	2017	2018
Shipments by steel type:				
Carbon steel	77,000	80,900	93.43	93.56
Alloy steel	2,920	3,070	3.54	3.56
Stainless steel	2,500	2,490	3.04	2.89
Total	82,500	86,400	100.00	100.00
Steel mill products:				
Ingots, blooms, billets, and slabs	658	709	0.80	0.82
Wire rods	1,920	2,240	2.33	2.59
Structural shapes, heavy	5,430	6,080	6.59	7.03
Plates, cut lengths	5,550	5,760	6.73	6.66
Plates, in coils	2,120	2,520	2.57	2.92
Rails	712	774	0.86	0.90
Railroad accessories	280	300	0.34	0.35
Bars, hot-rolled	3,670	4,240	4.46	4.91
Bars, light-shaped	1,820	1,820	2.20	2.11
Bars, reinforcing	6,390	7,090	7.75	8.20
Bars, cold finished	781	1,020	0.95	1.18
Pipe and tubing, standard pipe	570	775	0.69	0.90
Pipe and tubing, oil country goods	1,720	1,820	2.08	2.10
Pipe and tubing, line pipe	499	527	0.61	0.61
Pipe and tubing, mechanical tubing	491	588	0.60	0.68
Pipe and tubing, pipe piling	94	123	0.11	0.14
Pipe and tubing, pressure tubing	17	27	0.02	0.03
Pipe and tubing, stainless	14	--	0.02	--
Pipe and tubing, structural	464	502	0.56	0.58
Wire	384	392	0.47	0.45
Tin mill products, blackplate	43	41	0.05	0.05
Tin mill products, tinplate	970	960	1.18	1.11
Tin mill products, tin free steel	234	220	0.28	0.25
Tin mill products, tin coated sheets	64	70	0.08	0.08
Sheets, hot-rolled	20,300	19,900	24.65	23.03
Sheets, cold-rolled	10,100	10,200	12.28	11.85
Sheets and strip, hot dip galvanized	14,100	14,300	17.11	16.60
Sheets and strip, electrogalvanized	713	650	0.86	0.75
Sheets and strip, other metallic coated	1,650	1,890	2.00	2.19
Strip, hot-rolled	53	64	0.06	0.07
Strip, cold-rolled	582	738	0.71	0.85
Total	82,500	86,400	100.00	100.00
Shipments by markets:				
Service centers and distributors	21,900	21,600	26.60	25.00
Construction	21,200	24,600	25.75	28.43
Automotive	13,000	15,100	15.81	17.41
Machinery	1,290	1,550	1.57	1.80
Containers	1,380	1,600	1.67	1.85
All others	23,600	22,000	28.60	25.51
Total	82,500	86,400	100.00	100.00

-- Zero.

¹Table includes data available through January 30, 2020. Data are rounded to no more than three significant digits, except percentages; may not add to totals shown.

Source: American Iron and Steel Institute.

TABLE 4
U.S. IMPORTS AND EXPORTS OF STEEL MILL PRODUCTS,
BY COUNTRY OR LOCALITY¹

(Thousand metric tons)

Country or locality	2017		2018	
	Imports	Exports	Imports	Exports
Argentina	211	13	169	14
Belgium	130	67	163	40
Brazil	4,670	50	3,990	34
Canada	5,730	4,680	5,660	3,850
China	748	87	639	83
France	273	12	269	9
Germany	1,380	37	1,250	32
Japan	1,730	19	1,370	20
Korea, Republic of	3,410	43	2,510	31
Mexico	3,170	3,740	3,500	3,210
Netherlands	637	12	556	19
Russia	2,870	--	2,300	--
Spain	405	14	294	14
Sweden	302	17	271	11
Taiwan	1,130	21	970	19
Turkey	1,990	--	1,050	--
United Kingdom	351	28	280	30
Vietnam	679	--	1,010	--
Other	4,770 ^r	717 ^r	4,360	558
Total	34,600	9,550	30,600	7,980

^rRevised. -- Zero.

¹Table includes data available through January 30, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

Source: American Iron and Steel Institute.

TABLE 5
U.S. EXPORTS OF IRON AND STEEL PRODUCTS¹

(Thousand metric tons)

	2017	2018
Steel mill products:		
Ingots, blooms, billets, and slabs	143	94
Wire rods	101	80
Structural shapes, heavy	455	455
Steel piling	13	8
Plates, cut lengths	1,130	897
Plates, in coils	667	391
Rails, standard	81	91
Rails, other	59	68
Railroad accessories	39	46
Bars, hot-rolled	480	459
Bars, light-shaped	59	40
Bars, concrete reinforcing	349	292
Bars, cold-finished	138	138
Tool steel	105	132
Pipe and tubing, standard pipe	51	45
Pipe and tubing, oil country goods	346	260
Pipe and tubing, line pipe	114	98
Pipe and tubing, mechanical tubing	61	61
Pipe and tubing, stainless	33	31
Pipe and tubing, nonclassified	304	304
Pipe and tubing, structural	165	146
Pipe for piling	4	1
Wire	109	95
Tin mill products, blackplate	1	(2)
Tin mill products, tinplate	142	109
Tin mill products, tin free steel	9	9
Sheets, hot-rolled	1,140	723
Sheets, cold-rolled	954	778
Sheets and strip, hot-dip galvanized	1,320	1,210
Sheets and strip, electrogalvanized	209	172
Sheets and strip, other metallic coated	237	233
Sheets and strip, electrical	56	51
Strip, hot-rolled	185	171
Strip, cold-rolled	297	287
Total	9,550	7,980
Fabricated steel products:		
Structural shapes, fabricated	276	277
Rails, used	2	1
Railroad products	179	190
Wire rope	22	24
Wire, stranded products	24	22
Wire, other products	64	83
Springs	133	135
Nails and staples	29	27
Fasteners	667	650
Chains and parts	44	44
Grinding balls	125	121
Pipe and tube fittings	29	30
Other ³	192	190
Total	1,790	1,790
Grand total	11,300	9,770

See footnotes at end of table.

TABLE 5—Continued
 U.S. EXPORTS OF IRON AND STEEL PRODUCTS¹

(Thousand metric tons)

	2017	2018
Cast iron and steel products:		
Cast steel pipe fittings	20	22
Cast iron pipe and fittings	28	28
Cast steel rolls	(2)	(2)
Cast grinding balls ⁴	41	33
Granules, shot and grit ⁵	31	34
Other castings	69	79
Total	189	196

¹Table includes data available through January 30, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

²Less than ½ unit.

³Includes shapes cold formed, sashes and frames, fence and sign posts, architectural and ornamental work, and conduit.

⁴Schedule B number 7325.91.0000.

⁵Schedule B number 7205.10.0000.

Sources: American Iron and Steel Institute and the U.S. Census Bureau.

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

(Thousand metric tons)

	2017	2018
Steel mill products:		
Ingots, blooms, billets, and slabs	7,770	7,290
Wire rods	1,430	1,050
Structural shapes-heavy	780	516
Steel piling	101	63
Plates, cut lengths	751	599
Plates, in coils	1,240	1,420
Rails and railroad accessories	239	178
Bars, hot-rolled	1,320	1,110
Bars, light-shaped	153	125
Bars, reinforcing	1,420	1,060
Bars, cold-finished	317	298
Tool steel	157	159
Pipe and tubing, standard pipe	1,060	802
Pipe and tubing, oil country goods	3,100	2,540
Pipe and tubing, line pipe	2,030	1,990
Pipe and tubing, mechanical tubing	608	596
Pipe and tubing, pressure tubing	60	53
Pipe and tubing, stainless	137	136
Pipe and tubing, nonclassified	15	17
Pipe and tubing, structural	574	437
Pipe for piling	39	21
Wire	777	696
Tin mill products, blackplate	61	69
Tin mill products, tinplate	854	698
Tin mill products, tin free steel	212	191
Sheets, hot-rolled	1,930	2,360
Sheets, cold-rolled	2,660	2,040
Sheets and strip, hot-dip galvanized	3,100	2,760
Sheets and strip, electrogalvanized	135	74
Sheets and strip, other metallic coated	1,070	847
Sheets and strip, electrical	97	82
Strip, hot-rolled	181	151
Strip, cold-rolled	213	180
Total	34,600	30,600
Fabricated steel products:		
Structural shapes, fabricated	1,420	1,490
Rails, used	50	6
Railroad products	187	201
Wire rope	127	149
Wire-stranded products	297	326
Wire, other products	256	250
Springs	424	447
Nails and staples	735	795
Fasteners	1,330	1,360
Chains and parts	146	144
Grinding balls	110	100
Pipe and tube fittings	396	495
Other ²	612	592
Total	6,090	6,360
Grand total	40,700	37,000
Cast iron and steel products:		
Cast steel pipe fittings	163	189
Cast iron pipe and fittings	43	33
Cast steel rolls	12	17
Cast grinding balls ³	16	19
Granules, shot and grit ⁴	30	30
Other castings	259	310
Total	523	598

See footnotes at end of the table.

TABLE 6—Continued
U.S. IMPORTS OF IRON AND STEEL PRODUCTS¹

(Thousand metric tons)

¹Table includes data available through January 30, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

²Includes shapes cold formed, sashes and frames, fence and sign posts, architectural and ornamental work; and conduit.

³Harmonized Tariff Schedule of the United States (HTS) code 7325.91.0000.

⁴HTS code 7205.10.0000.

Sources: American Iron and Steel Institute and the U.S. Census Bureau.

TABLE 7
U.S. IMPORTS OF STAINLESS STEEL¹

(Metric tons)

Product	2017	2018
Semifinished	221,000	164,000
Plate	87,800	81,300
Sheet and strip	392,000	321,000
Bars and shapes	165,000	157,000
Wire and wire rods	79,300	78,400
Pipe and tube	137,000	136,000
Total	1,080,000	937,000

¹Table includes data available through January 30, 2020. Data are rounded to no more than three significant digits; may not add to totals shown.

Source: American Iron and Steel Institute.

TABLE 8
COAL AND COKE AT COKE PLANTS^{1,2}

(Thousand metric tons)

	2017	2018
Coal, consumption	15,900	16,600
Coke:		
Production ³	11,700	12,500
Exports	1,100	1,040
Imports	53	106
Consumption, apparent ³	10,700	11,800

¹Table includes data available through January 30, 2020. Data are rounded to no more than three significant digits.

²Includes furnace and merchant coke plants.

³Does not include breeze.

Source: U.S. Energy Information Administration, Quarterly Coal Report.

TABLE 9
 PIG IRON AND DIRECT-REDUCED IRON: WORLD PRODUCTION, BY COUNTRY OR LOCALITY^{1,2}

(Thousand metric tons)

Country or locality ³	2014	2015	2016	2017	2018
Algeria, pig iron ^e	300	300	300	300	300
Argentina:					
Direct-reduced iron	1,663 ^r	1,252 ^r	773 ^r	1,231 ^r	1,810
Pig iron	2,766	2,685	2,141	2,171 ^r	2,184
Australia, pig iron	3,282	3,594	3,642 ^r	3,758 ^r	3,882
Austria, pig iron	6,029	5,805	5,642	6,335 ^r	5,269
Bahrain, pig iron	1,440	1,230	1,260	1,260	1,300 ^c
Belgium, pig iron	4,388	4,248	4,869	4,860 ^r	4,900
Bosnia and Herzegovina, pig iron	860	845	778	738 ^r	664
Brazil, pig iron	27,016	27,803	26,129 ^r	28,331 ^r	28,655
Canada:					
Direct-reduced iron	1,550	1,502	1,399 ^r	1,608 ^r	1,670
Pig iron	6,728	5,851	6,240	6,306	6,498
Chile, pig iron	584	644	678	670 ^r	661
China, pig iron	713,740	691,410	702,270 ^r	713,620 ^r	771,050
Colombia, pig iron	234	240	225	203 ^r	205
Czechia, pig iron	4,152	4,031	4,165 ^r	3,691 ^r	4,005
Egypt:					
Direct-reduced iron	2,880	2,451 ^r	2,618 ^r	4,667 ^r	5,800
Pig iron	550	500	500	500	500 ^c
Finland, pig iron	2,475	2,594	2,670	2,604 ^r	2,976
France, pig iron	10,866	10,095	9,724	10,678 ^r	10,530
Germany:					
Direct-reduced iron	570	550	600	630 ^r	560
Pig iron	27,379	27,844 ^r	27,269 ^r	28,410 ^r	27,271
Hungary, pig iron	801	1,247	863	1,311	1,355
India:					
Direct-reduced iron	24,542 ^r	22,644 ^r	26,982 ^r	29,505 ^r	28,110
Pig iron	55,166	58,393	63,714 ^r	66,808 ^r	71,497
Indonesia, pig iron	120 ^c	--	--	--	--
Iran:					
Direct-reduced iron	14,551	14,546	16,013 ^r	19,401 ^r	25,750
Pig iron	2,782	2,459	2,251	2,293 ^r	2,362
Italy, pig iron	6,371	5,051	6,048	5,052 ^r	4,836
Japan, pig iron	83,872	81,011	80,186 ^r	78,330 ^r	77,328
Kazakhstan, pig iron	3,185	3,234	3,595 ^r	3,775 ^r	2,834
Korea, North, pig iron ^e	250	250	250	250	250
Korea, Republic of, pig iron	46,909	47,639	46,336 ^r	47,071 ^r	47,124
Libya, direct-reduced iron	995 ^r	450	700 ^r	562 ^r	612
Malaysia, direct-reduced iron	1,007 ^r	957 ^r	656 ^r	570 ^r	750
Mexico:					
Direct-reduced iron	5,976	5,499 ^r	5,306 ^r	6,011 ^r	5,970 ^c
Pig iron	5,116	4,573 ^r	4,476 ^r	4,245 ^r	4,428
Netherlands, pig iron	5,868	6,050	6,092 ^r	6,145 ^r	6,150
New Zealand, pig iron	680	678	670	683 ^r	679
Norway, pig iron	102	100	100	100 ^c	100 ^c
Oman, direct-reduced iron	1,420 ^r	1,509 ^r	1,439 ^r	1,526 ^r	1,500
Pakistan, pig iron	142	163	--	--	--
Paraguay, pig iron	71	73	50	38	39
Peru, direct-reduced iron	88	72	11	--	--
Poland, pig iron	4,640 ^r	4,826 ^r	4,680 ^r	5,159 ^r	4,788
Qatar, direct-reduced iron	2,547	2,631	2,506	2,548	2,630
Romania, pig iron	1,631	1,983 ^r	1,972 ^r	1,927 ^r	2,180 ^c
Russia:					
Direct-reduced iron	5,350	5,436 ^r	5,820 ^r	6,990 ^r	7,900 ^c
Pig iron	51,460	52,411	51,874 ^r	52,127 ^r	51,664
Saudi Arabia, direct-reduced iron	6,460	5,800	5,119 ^r	4,812 ^r	5,000
Serbia, pig iron	550	904	1,154	1,340 ^r	1,593
Slovakia, pig iron	3,838	3,738	3,987	4,106 ^r	4,652

See footnotes at end of table.

TABLE 9—Continued
 PIG IRON AND DIRECT-REDUCED IRON: WORLD PRODUCTION, BY COUNTRY OR LOCALITY^{1,2}

(Thousand metric tons)

Country or locality ³	2014	2015	2016	2017	2018
South Africa:					
Direct-reduced iron	1,612	1,125	702 ^r	925 ^r	830
Pig iron	4,402	4,464	4,311 ^r	4,352 ^r	4,611
Spain, pig iron	3,958	4,450	4,114	4,462 ^r	4,521
Sweden, pig iron	3,078	2,865	3,078	3,111 ^r	3,172
Taiwan, pig iron	14,440	14,370	14,830	14,400	14,800
Trinidad and Tobago, direct-reduced iron	3,240 ^r	2,520 ^r	1,500	1,590 ^r	1,540
Turkey, pig iron	9,364	10,184	10,304 ^r	10,589 ^r	10,536
Ukraine, pig iron	24,801	21,878 ^r	23,560 ^r	20,123 ^r	20,565
United Arab Emirates, direct-reduced iron	2,409 ^r	3,190	3,479 ^r	3,608	3,780
United Kingdom, pig iron	9,705	8,774	6,142 ^r	5,996 ^r	5,646
United States:					
Direct-reduced iron	1,300	1,100	1,810	2,990	3,350
Pig iron	29,400	25,400	22,300	22,400	24,100
Venezuela, direct-reduced iron	1,680	2,750	1,590	1,680 ^r	990
Vietnam, pig iron	1,393	1,700	2,600 ^r	4,250 ^r	6,449
Total	1,270,000 ^r	1,230,000	1,250,000 ^r	1,280,000 ^r	1,340,000
Of which:					
Direct-reduced iron	79,800 ^r	76,000 ^r	79,000 ^r	90,900 ^r	93,600
Pig iron	1,190,000	1,160,000	1,170,000 ^r	1,180,000	1,250,000

^rEstimated. ^rRevised. -- Zero.

¹Table includes data available through September 17, 2019. All data are reported unless otherwise noted. Totals, U.S. data, and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²Production of pig iron is obtained from virgin iron ore and scrap smelted in a blast furnace for use in steel production. Direct-reduced iron is obtained from ore by reduction of oxides to metal without melting.

³In addition to the countries and (or) localities listed, other countries may have produced limited quantities of pig iron, but available information was inadequate to make reliable estimates of output.

TABLE 10
RAW STEEL: WORLD PRODUCTION, BY COUNTRY OR LOCALITY^{1,2}

(Thousand metric tons, gross weight)

Country or locality ³	2014	2015	2016	2017	2018
Afghanistan	24	3	24	33	33 ^e
Albania	560	150	50 ^{r, e}	-- ^r	--
Algeria	415	650	650	415 ^r	2,000
Argentina	5,488	5,028	4,126	4,624 ^r	5,162
Australia	4,582	4,935	5,160 ^r	5,335 ^r	5,689
Austria	7,876	7,687	7,438 ^r	8,134 ^r	6,885
Azerbaijan	324	302	345 ^r	387 ^r	382
Bahrain ^c	970	970	960	960	960
Belarus	2,598	2,577 ^r	2,266 ^r	2,433 ^r	2,580
Belgium	7,331	7,257	7,687	7,842 ^r	8,020
Bosnia and Herzegovina	792	796	783 ^r	735 ^r	695
Brazil ⁴	33,897 ^r	33,256 ^r	31,275	34,350 ^r	34,735
Bulgaria	612	543	493 ^r	652 ^r	666
Canada	12,730	12,473	12,646	13,614 ^r	13,075
Chile ⁴	1,079	1,112	1,153	1,158 ^r	1,145
China ⁵	822,300	803,820	807,610 ^r	831,700	928,300
Colombia	1,208	1,211	1,272	1,253 ^r	1,219
Croatia	167	122	--	--	--
Cuba	258	222	205 ^r	210 ^r	222
Czechia	5,360	5,262	5,305	4,600	4,966
Ecuador	667	720	576	561 ^r	583
Egypt	6,485	5,506	5,036	6,870 ^r	7,807
El Salvador	121	124	100	96 ^r	99
Finland	3,807	3,988	4,102 ^r	4,004 ^r	4,146
France	16,143	14,984	14,413	15,505 ^r	15,391
Germany	42,943	42,674 ^r	42,081 ^r	43,910 ^r	42,440
Greece	1,022	910	1,158	1,359 ^r	1,464
Guatemala	395	403	314	294 ^r	300
Hungary	1,152	1,675	1,274	1,901 ^r	1,988
India	87,292	89,026	95,477	101,455 ^r	106,463
Indonesia	4,428	4,854	4,746	5,195 ^r	6,060 ^e
Iran	16,331	16,146	17,895	21,236 ^r	25,000
Israel ^c	300	300	300	300	300
Italy	23,714	22,018 ^r	23,373	24,068 ^r	24,475
Japan	110,666	103,134 ^r	104,775	104,661 ^r	104,319
Kazakhstan	2,909	2,948	3,175 ^r	3,412 ^r	3,350
Kenya	370	360	410 ^e	430 ^e	430 ^e
Korea, North	1,220	1,079	1,220 ^r	1,090 ^r	1,100 ^e
Korea, Republic of	71,542	69,670	68,575 ^r	71,030 ^r	72,463
Libya	750 ^r	389 ^r	538 ^r	485 ^r	442
Luxembourg	2,193	2,127	2,175	2,172	2,245
Macedonia	196	165	239	238	265
Malaysia	4,316	3,784	2,764	3,215 ^r	3,200
Mauritania ^c	5	5	5	5	5
Mexico	18,900 ^{r, e}	18,218 ^r	18,809	19,924 ^r	20,110
Moldova	344	430	128	469	503
Mongolia	64 ^r	44 ^r	17 ^r	21 ^r	29
Montenegro	140 ^e	150	120 ^e	200 ^{r, e}	200 ^e
Morocco	501 ^r	516	520	550 ^r	550 ^e
Netherlands	6,964	6,995	6,917	6,781 ^r	6,813
New Zealand	859	793	577	657 ^r	652
Nigeria ^c	600 ^r	620 ^r	620 ^r	620 ^r	620
Norway	600	590	620	603 ^r	575
Oman ^c	1,500	2,000	2,000	2,000	2,000
Pakistan	2,420 ^{r, e}	2,890 ^{r, e}	3,553	4,966 ^r	4,760
Paraguay	47	48	35	24	25
Peru	1,078	1,082	1,168	1,207	1,217
Philippines	1,196	968	1,075	1,378 ^r	1,370

See footnotes at end of table.

TABLE 10—Continued
RAW STEEL: WORLD PRODUCTION, BY COUNTRY OR LOCALITY^{1,2}

(Thousand metric tons, gross weight)

Country or locality ³	2014	2015	2016	2017	2018
Poland	8,800	9,336 ^r	9,161 ^r	10,540 ^r	10,336
Portugal	2,070	2,030	2,010	2,076 ^r	2,215
Qatar	2,867 ^r	2,594 ^r	2,521	2,645 ^r	2,700 ^e
Romania	3,193	3,423 ^r	3,370 ^r	3,443 ^r	3,624
Russia	70,548	69,422 ^r	70,808	71,300	71,680
Rwanda ^c	15	15	19	23	23
Saudi Arabia	6,291	5,230 ^e	5,461	4,831 ^r	5,240
Serbia	583	955	1,173	1,477 ^r	1,973
Singapore	540	501	520	596 ^r	600
Slovakia	4,705	4,562	4,808	4,974 ^r	5,225
Slovenia	615	604	613	648 ^r	654
South Africa	6,412	6,417	6,141	6,301 ^r	6,327
Spain	14,249	14,845	13,616	14,444 ^r	14,298
Sweden	4,540 ^{r,e}	4,370 ^{r,e}	4,620 ^{r,e}	4,926 ^r	4,654
Switzerland	1,475	1,480 ^e	1,500	1,450 ^{r,e}	1,500 ^e
Syria ^c	5	5	5	5	5
Taiwan	23,121	21,392	21,751	22,438 ^r	23,230
Tanzania ^e	190 ^r	210 ^r	230 ^r	250 ^r	250
Thailand	4,095	3,720 ^r	3,824 ^r	4,471 ^r	4,315
Trinidad and Tobago	483	267	-- ^r	-- ^r	--
Tunisia	101	50	92 ^r	50 ^e	83
Turkey	34,035	31,517	33,163	37,524 ^r	37,312
Uganda ^c	66 ^r	72 ^r	71 ^r	71 ^r	71
Ukraine	27,373	22,935	24,197 ^r	21,334 ^r	21,100
United Arab Emirates	2,390	3,006	3,149	3,309 ^r	3,247
United Kingdom	12,120	10,907	7,635	7,491 ^r	7,685
United States	88,200	78,800	78,500	81,600	86,600
Uruguay	94	97 ^e	61	58	60
Uzbekistan	751	643	654	657 ^r	680
Venezuela	1,485	1,345	553	444 ^r	129
Vietnam	3,954	4,093 ^r	7,805 ^r	11,473 ^r	17,723
Zambia	86 ^r	52	45	54 ^e	75 ^e
Total	1,670,000	1,620,000	1,630,000	1,690,000	1,810,000

^cEstimated. ^rRevised. -- Zero.

¹Table includes data available through August 29, 2019. All data are reported unless otherwise noted. Totals, U.S. data and estimated data are rounded to no more than three significant digits; may not add to totals shown.

²Steel formed in solid state after melting, suitable for further processing or sale; for some countries, includes material reported as liquid steel, presumably measured in the molten state prior to cooling in any specific form.

³In addition to the countries and (or) localities listed, Hong Kong, Mozambique, and Sri Lanka may have produced steel, but available information was inadequate to make reliable estimates of output.

⁴Does not include castings.

⁵Data reported by the State Statistical Bureau and are considered by the Government of China to be official statistics.