



2019 Minerals Yearbook

IRON AND STEEL [ADVANCE RELEASE]

IRON AND STEEL

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In 2019, U.S. raw steel production increased to 87.8 million metric tons (Mt), a slight increase from 86.6 Mt in 2018. Of that quantity, carbon steel accounted for 80.5 Mt, stainless steel accounted for 2.59 Mt, and other alloy steels accounted for 4.68 Mt. The domestic industry used 79.8% of the raw steel production capability. Exports of steel-mill products decreased by 16% to 6.70 Mt in 2019 from 7.98 Mt in 2018, and imports decreased by 17% to 25.3 Mt in 2019 from 30.6 Mt in 2018. Among raw materials, pig iron production decreased by 7% to 22.3 Mt, and direct-reduced iron (DRI) production increased by 9% to 3.66 Mt (table 1).

World production of raw steel increased by 3% to 1.86 billion metric tons (Gt) in 2019 from 1.81 Gt in 2018. In 2019, global production of pig iron increased slightly to 1.28 Gt from 1.25 Gt in 2018 and production of DRI was essentially unchanged at 107 Mt compared with 106 Mt in 2018 (table 1). In 2019, global steelmaking capacity decreased for the second year in a row to 2,360 million metric tons per year (Mt/yr), a slight decrease from 2,330 Mt/yr in 2018 and nearly unchanged from 2,350 Mt/yr in 2017 (Organisation for Economic Co-operation and Development, undated). Global capacity utilization, calculated as the difference between reported global production and global steelmaking capacity, increased to 79.1% in 2019 from 77.9% in 2018 and 73.7% in 2017, as capacity decreased and production increased.

Legislation and Government Programs

In March 2018, the President of the United States issued Proclamations 9705 on adjusting imports of steel into the United States, after investigations conducted by the U.S. Department of Commerce (DOC), under section 232 of the Trade Expansion Act of 1962, concluded that dependence on steel imports constituted a national security threat. The initial proclamations were announced in Federal Register notices and instituted a 25% ad valorem tariff on certain steel-mill articles imported from all countries, with the exception of Canada and Mexico. There were several additional proclamations in 2018 that instituted the tariff on Canada and Mexico and most countries in the world. Two proclamations were issued in May 2019 to remove the section 232 tariffs on imports from Canada and Mexico following an agreement with both countries on additional trade provisions (Executive Office of the President, 2018; U.S. Department of Homeland Security, undated). As of December 2019, steel imports from all countries except Argentina, Australia, Brazil, Canada, the Republic of Korea, and Mexico were subject to the 25% ad valorem tariff.

Production

In 2019, U.S. raw steel production increased to 87.8 Mt, a slight increase from 86.6 Mt in 2018 (table 1). The American

Iron and Steel Institute (AISI) estimated raw steel production capability in 2019 to be 110 Mt, a slight decrease from 111 Mt in 2018. Production in 2019 accounted for 79.8% of capability utilization compared with 78.2% in 2018 (American Iron and Steel Institute, 2020, p. 73). Data from the AISI are reported on a net (short) ton basis and converted to metric tons for this report.

Integrated steel producers smelted iron ore to make liquid pig iron in blast furnaces and used basic oxygen furnaces (BOFs) to refine the liquid iron, along with some steel scrap, to produce raw steel. The BOF process was used to make 26.6 Mt of steel in 2019 in the United States, a 4% decrease from 27.7 Mt in 2018. The use of this process decreased to 30.3% of total steel production in 2019 from 32.0% in 2018 (American Iron and Steel Institute, 2020, p. 70–71). Blast furnaces in the United States were operated by AK Steel Corp., ArcelorMittal USA, LLC, and U.S. Steel Corp. at 11 locations in 2019 (Association for Iron and Steel Technology, 2020, p. 169–170).

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 steel, and tool steel; high-temperature alloys; forged ingots; and other low-volume steel products. During 2019, a total of 51 companies operated 98 EAF facilities in the United States (Association for Iron and Steel Technology, 2020, p. 172–180). These mills accounted for 69.7% of all domestic steelmaking, compared with 68.0% in 2018. EAF facilities produced 61.2 Mt of steel in 2019, 4% more than the 58.9 Mt produced in 2018 (American Iron and Steel Institute, 2020, p. 70–71).

Raw liquid steel was mostly cast into semifinished products in continuous casting machines. Continuous casting production accounted for nearly all the domestic steel production, or 87.6 Mt. Only 220,000 metric tons was produced in ingot form in 2019 (American Iron and Steel Institute, 2020, p. 71).

Consumption

Steel products were delivered in a variety of intermediate forms as continuous casting products (such as bars, billets, and blooms), in a variety of semifinished steel products (such as plates, rods, sheets, or wires), or finished steel products (such as nails, pipes, rebar, or tracks). Steel-mill products were produced either by forging or by rolling into forms normally delivered for fabrication or use. Some companies purchased semifinished steel-mill products directly from other steel companies and used 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 consumption of steel (calculated as net shipments plus imports minus exports minus semifinished imports plus or minus stock changes) equaled 98.4 Mt in 2019, a 4% decrease from 102 Mt in 2018. Since 2000, apparent consumption of steel has ranged from a high of 126 Mt in 2006 to a low of 58.6 Mt in 2009. In 2019, net shipments of steel-mill products by U.S. companies totaled 87.3 Mt, a slight increase from 86.4 Mt in 2018. Shipments of steel-mill products by end use in 2019 were led by construction and contractors' products (27.3 Mt); automotive products (14.9 Mt); containers, packaging, and shipping materials (1.54 Mt); and rail transportation products (1.39 Mt) (American Iron and Steel Institute, 2020, p. 27).

Prices

The Producer Price Index (PPI) program of the U.S. Department of Labor, Bureau of Labor Statistics (undated) measures the average change over time of the selling prices received by domestic producers for their output. Exports are included but imports are excluded so that the output of U.S. producers may be valued. The PPI of steel-mill products is one of about 10,000 PPIs for individual and groups of products released each month. The PPI (1982=100) for steel-mill products was 204.0 in 2019, a decrease of 3% from 211.1 in 2018 (table 1).

As of September 2019, steel prices had declined since peaking in mid-2018 following the implementation of the section 232 steel tariffs in March 2018. Decreases in demand growth from the automotive and nonresidential construction industries, as well as increased iron ore and other raw material costs, were attributed to declining purchase rates among service centers. U.S. Steel idled one furnace at Gary Works in Indiana and planned to indefinitely idle the East Chicago Tin plant, a finishing facility near Gary Works. In addition, U.S. Steel planned to spend \$2 billion updating deferred maintenance, including the Gary Works facility (Pete, 2019). In September 2019, after steady declines, prices began to rebound and increased during the last 4 months of the year. Following an increase of steel plate prices by SSAB AM (Sweden) by \$36 per metric ton in November 2019, U.S. Steel Corp increased prices by \$27 per metric ton, the third increase in a month, bringing the price of hot-rolled coil to \$535 per metric ton and hot-dipped galvanized steel to \$716 per metric ton (Surran, 2019).

Foreign Trade

U.S. exports of steel-mill products in 2019 equaled 6.70 Mt, a 16% decrease from 8.00 Mt in 2018. Mexico was the leading destination of domestic exports, accounting for 46% of total domestic exports, followed by Canada (44%). In 2019, exports to Canada decreased by 24% and exports to Mexico decreased by 5% compared with those in 2018. Domestic imports of steel-mill products totaled 25.3 Mt in 2019, a 17% decrease from 30.6 Mt in 2018. Canada was the leading source of imports, accounting for 20%, followed by Brazil (15%), Mexico (13%), the Republic of Korea (9%), and Japan (4%) (tables 1, 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 market represented by imported steel. The amount of semifinished steel consumed by companies that also produced raw steel is subtracted from domestic consumption to avoid double counting the imported, semifinished steel and the products produced from it. In 2019, imports, as a percentage of apparent supply, equaled 19%, a decrease from 23% in 2018 and a decrease from 27% in 2017 (American Iron and Steel Institute, 2020, p. 45).

World Review

World production of pig iron in 2019 totaled 1,280 Mt, a slight increase from 1,260 Mt in 2018 (tables 1, 9). China continued to be the leading producer of pig iron in the world (producing 809 Mt, which was 63% of the world total and 5% greater than 771 Mt in 2018), followed by Japan (74.9 Mt), India (74.1 Mt), Russia (50.3 Mt), the Republic of Korea (47.5 Mt), Brazil (26.2 Mt), Germany (25.5 Mt), and the United States (22.3 Mt). World production of DRI totaled 107 Mt in 2019, essentially unchanged from 106 Mt in 2018. The leading producer of DRI was India (36.9 Mt), followed by Iran (27.7 Mt), Russia (8.0 Mt), Mexico (6.0 Mt), and Saudi Arabia (4.6 Mt). World production of raw steel totaled 1.860 Gt, a 4% increase from 1.81 Gt in 2018 (table 10). China led global steel production with 996 Mt, followed by India (111 Mt), Japan (99.3 Mt), the United States (87.8 Mt), Russia (71.6 Mt), and the Republic of Korea (71.4 Mt). These six countries accounted for 77% of global production.

China led apparent consumption of steel in finished steel products (908 Mt) for any single country, followed by India (102 Mt), the United States (97.7 Mt), and Japan (63.2 Mt). The leading exporter of steel in 2019 was China with 63.8 Mt, followed by Japan (33.1 Mt), the Republic of Korea (29.9 Mt), Russia (29.5 Mt), and the European Union (27.8 Mt). The leading importer of steel in 2019 was the European Union (excluding intraregional trade) with 40.2 Mt, followed by the United States (27.1 Mt), Germany (including intraregional trade) (23.1 Mt), Italy (including intraregional trade) (20.1 Mt), and Thailand (16.7 Mt). The leading global steel producers were ArcelorMittal S.A. (97 Mt), China Baowu Steel Group Corp., Ltd. (95 Mt), Nippon Steel and Sumitomo Metal Corp. Group (52 Mt), and HBIS Group (47 Mt) (World Steel Association, 2020a, p. 8, 16, 27).

Restructuring efforts in China were made difficult by increasing fragmentation in the steel industry as small mills brought new capacity online. China had worked to consolidate major domestic steel producers in an effort to decrease pollution and excess capacity, with the goal for the top 10 steelmakers to account for 60% of domestic production capacity by 2020. According to China's Ministry of Industry and Information Technology, the increased capacity was generated illegally through unauthorized new mills and mills that were expected to be shut down in capacity swaps. As of 2019, 140 Mt of capacity at 700 small mills and 150 Mt of capacity at larger mills had been eliminated since 2015 (Patton and Zhang, 2019).

Steel production at the Iskenderun plant in Turkey, a subsidiary of Koç Holding, was expected to be suspended from September 2019 through January 2020. The idling was

attributed to a decrease in domestic demand for steel billets, reductions in purchases, and a contraction in Turkey's economy. The plant's capacity of 1.2 Mt/yr of raw steel had experienced lower utilization rates through the first 9 months of 2019 (Argus Media, 2019).

Outlook

The increase or decrease of gross domestic product (GDP), the broadest measure of a nation's economic activity, can 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 2.4%, -5.2%, and 4.2%, respectively, after 3.0% and 3.3% in 2018 and 2017, respectively. The 2019 rate of GDP growth for China is estimated to be 6.1% and is projected to decrease to 1.0% in 2020 and increase to 6.9% in 2021. The rate of GDP growth for India is estimated to be 4.2% in 2019 and is projected to decrease to -3.2% in 2020 and then increase to 3.1% in 2021 (World Bank, The, 2020, p. 4). The U.S. Federal Reserve Board's projections for GDP rate of growth for the United States are -6.5% for 2020, 5.0% for 2021, and 3.5% for 2022 (Board of Governors of the Federal Reserve System, 2020).

According to the World Steel Association (2020b), global consumption of finished steel is expected to decrease by 6% from 1,770 Mt in 2019 to 1,650 Mt in 2020 and then increase by 4% to 1,720 Mt in 2021. In all regions, steel demand is projected to decrease owing to decreased manufacturing, automotive, and other steel end-use demands as a result of the global coronavirus disease 2019 (COVID-19) pandemic in 2020. In the United States, steel demand is expected to decrease by 8% in 2020 from that in 2019 and increase by 15% in 2021 from that in 2020. Infrastructure investment plans in the United States are not expected to contribute to an increase in steel demand in the short term, despite ongoing legislative efforts on infrastructure development. In developing countries, steel demand was expected to increase by 17% in 2020 and then increase by 8% in 2021, although the decrease in demand owing to impacts from the COVID-19 pandemic were expected to significantly alter forecasts for 2020. China's steel demand is forecast to increase by 1% in 2020 and remain flat in 2021, owing to a lack of investment and only mild stimulus in 2019, as well as the continued slowing in construction activity and decelerating growth in the automotive and home appliance sectors.

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TABLE 1
SALIENT IRON AND STEEL STATISTICS¹

(Thousand metric tons unless otherwise noted)

	2015	2016	2017	2018	2019
United States:					
Pig iron: ²					
Production	25,400	22,300	22,400	24,100	22,300
Exports	17	37	37	14	7
Imports for consumption	4,530	3,870	5,130	6,020	5,010
Direct-reduced iron:					
Production	1,100	1,810	2,990	3,350	3,660
Exports ³	20	178	640	551	314
Imports for consumption ³	1,860	1,600	1,790	1,750	1,760
Raw steel production: ⁴					
Carbon steel	73,600	73,200	75,700	79,100	80,500
Stainless steel	2,350	2,480	2,750	2,810	2,590
All other alloy steel	2,930	2,820	3,170	4,740	4,680
Total	78,800	78,500	81,600	86,600	87,800
Capability utilization, percent	70.1	70.5	74.0	78.2	79.8
Steel mill products: ²					
Net shipments	78,500	78,500	82,500	86,400	87,300
Exports	9,050	8,450	9,550	7,980	6,700
Imports	35,200	30,000	34,600	30,600	25,300
Producer Price Index (1982=100.0) ⁵	177.1	167.8	187.4	211.1	204.0
World production:					
Pig iron	1,160,000	1,170,000	1,190,000 ^r	1,250,000	1,280,000
Direct-reduced iron	76,000	79,000	90,900	106,000 ^r	107,000
Raw steel	1,610,000 ^r	1,630,000	1,730,000 ^r	1,810,000	1,860,000

^rRevised.

¹Table includes data through September 3, 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).

³Source: U.S. Census Bureau.

⁴Source: AISI. Raw steel is defined by AISI as steel in the first solid state after melting, suitable for rolling.

⁵Source: U.S. Department of Labor, Bureau of Labor Statistics.

TABLE 2
MATERIALS CONSUMED IN BLAST FURNACES AND
PIG IRON PRODUCED^{1,2}

(Thousand metric tons)

Material	2018	2019
Iron oxides:		
Pellets	30,800	29,300
Sinter ³	4,530	4,380
Total	35,300	33,600
Scrap ⁴	1,550	1,630
Coke	7,620 ^r	7,290
Pig iron, produced	24,100	22,300

^rRevised.

¹Table includes data through September 3, 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	
	2018	2019	2018	2019
Shipments by steel type:				
Carbon steel	80,900	82,400	93.56	94.49
Alloy steel	3,070	2,530	3.56	2.90
Stainless steel	2,490	2,280	2.89	2.61
Total	86,400	87,300	100.00	100.00
Steel mill products:				
Ingots, blooms, billets, and slabs	709	525	0.82	0.60
Wire rods	2,240	2,860	2.59	3.28
Structural shapes, heavy	6,080	6,240	7.03	7.15
Plates, cut lengths	5,760	5,840	6.66	6.70
Plates, in coils	2,520	2,280	2.92	2.62
Rails	774	814	0.90	0.93
Railroad accessories	300	359	0.35	0.41
Bars, hot-rolled	4,240	4,560	4.91	5.23
Bars, light-shaped	1,820	2,060	2.11	2.36
Bars, reinforcing	7,090	7,740	8.20	8.87
Bars, cold finished	1,020	1,070	1.18	1.22
Pipe and tubing, standard pipe	775	843	0.90	0.97
Pipe and tubing, oil country goods	1,820	1,700	2.10	1.95
Pipe and tubing, line pipe	527	589	0.61	0.68
Pipe and tubing, mechanical tubing	588	510	0.68	0.58
Pipe and tubing, pipe piling	123	210	0.14	0.24
Pipe and tubing, pressure tubing	27	16	0.03	0.02
Pipe and tubing, structural	502	425	0.58	0.49
Wire	392	445	0.45	0.51
Tin mill products, blackplate	41	43	0.05	0.05
Tin mill products, tinplate	960	875	1.11	1.00
Tin mill products, tin free steel	220	190	0.25	0.22
Tin mill products, tin coated sheets	70	69	0.08	0.08
Sheets, hot-rolled	19,900	19,900	23.03	22.82
Sheets, cold-rolled	10,200	9,700	11.85	11.11
Sheets and strip, hot dip galvanized	14,300	14,100	16.60	16.11
Sheets and strip, electrogalvanized	650	570	0.75	0.65
Sheets and strip, other metallic coated	1,890	2,100	2.19	2.40
Strip, hot-rolled	64	82	0.07	0.09
Strip, cold-rolled	738	582	0.85	0.67
Total	86,400	87,300	100.00	100.00
Shipments by markets:				
Service centers and distributors	21,600	20,000	25.00	22.92
Construction	24,600	27,300	28.43	31.24
Automotive	15,100	14,900	17.41	17.11
Machinery	1,550	1,340	1.80	1.54
Containers	1,600	1,540	1.85	1.77
All others	22,000	22,200	25.51	25.42
Total	86,400	87,300	100.00	100.00

¹Table includes data through September 3, 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	2018		2019	
	Imports	Exports	Imports	Exports
Argentina	169	14	178	8
Belgium	163	40	114	28
Brazil	3,990	34	3,830	38
Canada	5,660	3,850	5,030	2,940
China	639	83	498	55
France	269	9	168	8
Germany	1,250	32	966	21
Japan	1,370	20	1,140	15
Korea, Republic of	2,510	31	2,340	34
Mexico	3,500	3,210	3,370	3,050
Netherlands	556	19	499	6
Russia	2,300	--	977	--
Spain	294	14	404	24
Sweden	271	11	203	9
Taiwan	970	19	753	13
Turkey	1,050	--	297	--
United Kingdom	280	30	231	27
Vietnam	1,010	--	602	--
Other	4,360	558	3,760	422
Total	30,600	7,980	25,300	6,700

-- Zero.

¹Table includes data through September 3, 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)

	2018	2019
Steel mill products:		
Ingots, blooms, billets, and slabs	94	72
Wire rods	80	49
Structural shapes, heavy	455	318
Steel piling	8	12
Plates, cut lengths	897	814
Plates, in coils	391	380
Rails, standard	91	91
Rails, other	68	49
Railroad accessories	46	44
Bars, hot-rolled	459	311
Bars, light-shaped	40	31
Bars, concrete reinforcing	292	136
Bars, cold-finished	138	108
Tool steel	132	103
Pipe and tubing, standard pipe	45	27
Pipe and tubing, oil country goods	260	210
Pipe and tubing, line pipe	98	80
Pipe and tubing, mechanical tubing	61	42
Pipe and tubing, stainless	31	26
Pipe and tubing, nonclassified	304	223
Pipe and tubing, structural	146	114
Pipe for piling	1	2
Wire	95	76
Tin mill products, blackplate	(2)	(2)
Tin mill products, tinplate	109	97
Tin mill products, tin free steel	9	11
Sheets, hot-rolled	723	586
Sheets, cold-rolled	778	644
Sheets and strip, hot-dip galvanized	1,210	1,230
Sheets and strip, electrogalvanized	172	193
Sheets and strip, other metallic coated	233	203
Sheets and strip, electrical	51	48
Strip, hot-rolled	171	140
Strip, cold-rolled	287	239
Total	7,980	6,700
Fabricated steel products:		
Structural shapes, fabricated	277	234
Rails, used	1	(2)
Railroad products	190	193
Wire rope	24	18
Wire, stranded products	22	16
Wire, other products	83	34
Springs	135	123
Nails and staples	27	25
Fasteners	650	644
Chains and parts	44	41
Grinding balls	121	126
Pipe and tube fittings	30	29
Other ³	190	76
Total	1,790	1,560
Grand total	9,770	8,260
Cast iron and steel products:		
Cast steel pipe fittings	22	19
Cast iron pipe and fittings	28	27
Cast steel rolls	(2)	(2)
Cast grinding balls ⁴	33	6
Granules, shot and grit ⁵	34	31
Other castings	79	66
Total	196	149

See footnotes at end of table.

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

¹Table includes data through September 3, 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)

	2018	2019
Steel mill products:		
Ingots, blooms, billets, and slabs	7,290	6,250
Wire rods	1,050	856
Structural shapes-heavy	516	499
Steel piling	63	87
Plates, cut lengths	599	530
Plates, in coils	1,420	1,050
Rails and railroad accessories	178	150
Bars, hot-rolled	1,110	818
Bars, light-shaped	125	104
Bars, reinforcing	1,060	1,000
Bars, cold-finished	298	233
Tool steel	159	120
Pipe and tubing, standard pipe	802	642
Pipe and tubing, oil country goods	2,540	2,140
Pipe and tubing, line pipe	1,990	1,650
Pipe and tubing, mechanical tubing	596	529
Pipe and tubing, pressure tubing	53	54
Pipe and tubing, stainless	136	104
Pipe and tubing, nonclassified	17	18
Pipe and tubing, structural	437	378
Pipe for piling	21	4
Wire	696	622
Tin mill products, blackplate	69	148
Tin mill products, tinplate	698	686
Tin mill products, tin free steel	191	230
Sheets, hot-rolled	2,360	1,710
Sheets, cold-rolled	2,040	1,540
Sheets and strip, hot-dip galvanized	2,760	2,210
Sheets and strip, electrogalvanized	74	63
Sheets and strip, other metallic coated	847	628
Sheets and strip, electrical	82	49
Strip, hot-rolled	151	106
Strip, cold-rolled	180	143
Total	30,600	25,300
Fabricated steel products:		
Structural shapes, fabricated	1,490	1,440
Rails, used	6	33
Railroad products	201	190
Wire rope	149	140
Wire-stranded products	326	351
Wire, other products	250	205
Springs	447	424
Nails and staples	795	703
Fasteners	1,360	1,240
Chains and parts	144	147
Grinding balls	100	98
Pipe and tube fittings	495	440
Other ²	592	358
Total	6,360	5,770
Grand total	37,000	31,100
Cast iron and steel products:		
Cast steel pipe fittings	189	149
Cast iron pipe and fittings	33	25
Cast steel rolls	17	19
Cast grinding balls ³	19	30
Granules, shot and grit ⁴	30	28
Other castings	310	272
Total	598	523

See footnotes at end of table.

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

¹Table includes data through September 3, 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	2018	2019
Semifinished	164,000	175,000
Plate	81,300	62,900
Sheet and strip	321,000	235,000
Bars and shapes	157,000	141,000
Wire and wire rods	78,400	67,200
Pipe and tube	136,000	104,000
Total	937,000	785,000

¹Table includes data through September 3, 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)

	2018	2019
Coal, consumption	16,600	16,300
Coke:		
Production ³	12,500	12,200
Exports	1,040	877
Imports	106	105
Consumption, apparent ³	11,800	11,300

¹Table includes data through September 3, 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	2015	2016	2017	2018	2019
Algeria, pig iron ^c	300	300	300	300	300
Argentina:					
Direct-reduced iron	1,252	773	1,231	1,606 ^r	1,006
Pig iron	2,685	2,141	2,171	2,184	1,964
Australia, pig iron	3,594	3,642	3,758	3,882	3,664
Austria, pig iron	5,805	5,642	6,335	5,269	5,750
Bahrain, pig iron	1,230	1,260	1,260	1,600 ^r	1,600 ^c
Belgium, pig iron	4,248	4,869	4,860	4,900	4,800
Bosnia and Herzegovina, pig iron	845	778	738	664	745
Brazil, pig iron	27,803	26,129	28,331	28,655	26,166
Canada:					
Direct-reduced iron	1,502	1,399	1,608	1,670	1,440
Pig iron	5,851	6,240	6,306	6,680 ^r	6,360
Chile, pig iron	644	678	670	661	595
China, pig iron	691,410	702,270	713,620	771,050	809,365
Colombia, pig iron	240	225	203	205	210
Czechia, pig iron	4,031	4,165	3,691	4,005	3,635
Egypt:					
Direct-reduced iron	2,451	2,618	4,667	5,753 ^r	4,426
Pig iron	500	500	500	500	500 ^c
Finland, pig iron	2,594	2,670	2,604	2,976	2,300
France, pig iron	10,097 ^r	9,724	10,678	10,530	9,878
Germany:					
Direct-reduced iron	550	600	630	560	600 ^c
Pig iron	27,844	27,269	27,816 ^r	27,271	25,490
Hungary, pig iron	1,247	863	1,311	1,355	1,152
India:					
Direct-reduced iron	22,644	26,982	29,505	34,213 ^r	36,858
Pig iron	58,393	63,714	66,808	72,641 ^r	74,099
Indonesia:					
Direct-reduced iron	53	--	22	237	300 ^c
Pig iron	2,460 ^r	2,640 ^r	2,650 ^r	2,730 ^r	2,700 ^c
Iran:					
Direct-reduced iron	14,546	16,013	19,401	25,750	27,730
Pig iron	2,459	2,251	2,293	2,362	2,735
Italy, pig iron	5,051	6,048	5,052	4,836	4,607
Japan, pig iron	81,011	80,186	78,330	77,328	74,907
Kazakhstan, pig iron	3,234	3,595	3,775	3,174 ^r	2,915
Korea, North, pig iron ^c	250	250	250	250	250
Korea, Republic of, pig iron	47,639	46,336	47,071	47,124	47,537
Libya, direct-reduced iron	450	700	562	612	880
Malaysia, direct-reduced iron	957	656	570	750	1,000 ^c
Mexico:					
Direct-reduced iron	5,499	5,306	6,011	5,972 ^r	5,975
Pig iron	4,573	4,476	4,245	4,428	3,840
Netherlands, pig iron	6,050	6,092	6,145	6,150	5,936
New Zealand, pig iron	678	670	683	679	672
Norway, pig iron	59 ^r	43 ^r	74 ^r	79 ^{r,c}	80 ^c
Oman, direct-reduced iron	1,509	1,439	1,526	1,500	1,600
Pakistan, pig iron	163	--	--	--	-- ^c
Paraguay, pig iron	73	50	38	39	40
Peru, direct-reduced iron	72	11	--	--	--
Poland, pig iron	4,826	4,680	5,159	4,788	4,440
Qatar, direct-reduced iron	2,631	2,506	2,548	2,630	2,423
Romania, pig iron	1,983	1,972	1,927	1,900 ^r	2,000
Russia:					
Direct-reduced iron	5,436	5,820	6,990	7,900	8,000
Pig iron	52,411	51,874	52,127	51,797 ^r	50,285
Saudi Arabia, direct-reduced iron	5,800	5,119	4,812	6,000 ^r	4,640

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	2015	2016	2017	2018	2019
Serbia, pig iron	904	1,154	1,340	1,593	1,577
Slovakia, pig iron	3,738	3,987	4,106	4,652	4,300
South Africa:					
Direct-reduced iron	1,125	702	925	835 ^r	661
Pig iron	4,464	4,311	4,352	4,611	3,791
Spain, pig iron	4,450	4,114	4,462	4,521	3,881
Sweden, pig iron	2,865	3,078	3,111	3,172	3,200
Taiwan, pig iron	14,370	14,890 ^r	14,361 ^r	14,841 ^r	14,720
Trinidad and Tobago, direct-reduced iron	2,520	1,500	1,590	1,540	1,560 ^e
Turkey, pig iron	10,184	10,304	10,589	10,536	9,869
Ukraine, pig iron	21,878	23,560	20,123	20,531 ^r	20,064
United Arab Emirates, direct-reduced iron	3,190	3,479	3,608	3,784 ^r	3,667
United Kingdom, pig iron	8,774	6,142	5,996	5,590 ^r	5,643
United States:					
Direct-reduced iron	1,100	1,810	2,990	3,350	3,660
Pig iron	25,400	22,300	22,400	24,100	22,300
Venezuela, direct-reduced iron	2,750	1,590	1,680	990	385
Vietnam, pig iron	1,700	2,600	4,250	6,449	8,300 ^e
Total	1,240,000 ^r	1,250,000	1,280,000	1,360,000 ^r	1,390,000
Of which:					
Direct-reduced iron	76,000	79,000	90,900	106,000 ^r	107,000
Pig iron	1,160,000	1,170,000	1,190,000 ^r	1,250,000	1,280,000

^eEstimated. ^rRevised. -- Zero.

¹Table includes data available through July 19, 2021. 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	2015	2016	2017	2018	2019
Afghanistan	3	24	33	33 ^e	33 ^e
Albania	150	50 ^e	--	--	--
Algeria	650	650	415	2,000 ^e	2,000 ^e
Argentina	5,028	4,126	4,624	5,162	4,645
Australia	4,935	5,160	5,335	6,035 ^r	5,493
Austria	7,687	7,438	8,134	6,885	7,423
Azerbaijan	302	345	387	382	326
Belarus	2,577	2,266	2,433	2,573 ^r	2,718
Belgium	7,257	7,687	7,842	7,980 ^r	7,905
Bosnia and Herzegovina	796	783	735	695	801
Brazil	33,258 ^r	31,642 ^r	34,778 ^r	35,407 ^r	32,236
Bulgaria	543	493	652	666	595
Canada	12,473	12,646	13,208 ^r	13,443 ^r	12,790
Chile	1,112	1,153	1,158	1,145	1,095
China	803,820	807,610 ⁴	870,740 ^{r,4}	920,027 ^r	996,342
Colombia	1,211	1,272	1,253	1,219	1,200
Croatia	122	--	--	--	--
Cuba	222	205	210	222	235
Czechia	5,262	5,305	4,550 ^r	4,938 ^r	4,563
Ecuador	720	576	561	583	605
Egypt	5,506	5,036	6,870	7,807	7,257
El Salvador	124	100	96	99	105
Finland	3,988	4,102	4,004	4,146	3,473
France	14,984	14,413	15,505	15,391	14,451
Germany	42,674	42,081	43,297 ^r	42,435 ^r	39,675
Greece	910	1,158	1,359	1,464	1,367
Guatemala	403	314	294	300	310
Hungary	1,675	1,274	1,901	1,988	1,770
India	89,026	95,477	101,455	109,272 ^r	111,246
Indonesia	4,854	4,746	5,195	6,183 ^r	6,400 ^e
Iran	16,146	17,895	21,236	24,520 ^r	31,900
Italy	22,018	23,373	24,068	24,532 ^r	23,245
Japan	103,134	104,775	104,661	104,319	99,284
Kazakhstan	2,948	3,175	3,412	3,964 ^r	4,085
Kenya ^e	360	410	430	440 ^r	440
Korea, North	1,079	1,220	1,090	810 ^r	800 ^e
Korea, Republic of	69,670	68,575	71,030	72,463	71,421
Libya	389	538	485	396 ^r	606
Luxembourg	2,127	2,175	2,172	2,228 ^r	2,200
Macedonia	165	239	238	265	239
Malaysia	3,784	2,764	3,215	4,110 ^r	4,520 ^e
Mauritania ^e	5	5	5	5	5
Mexico	18,218	18,809	19,924	20,204 ^r	18,595
Moldova	430	128	469	503	360
Mongolia	44	17	21	29	28
Montenegro ^e	150	120	120 ^r	120 ^r	120
Morocco	516	520	550	600 ^r	600 ^e
Netherlands	6,995	6,917	6,781	6,813	6,657
New Zealand	793	577	657	652	667
Nigeria ^e	620	620	620	640 ^r	630
Norway	590	620	603	575	621
Oman ^e	2,000	2,000	2,000	2,000	2,000
Pakistan	2,890 ^e	3,553	4,966	4,719 ^r	3,313
Paraguay	48	35	24	25	26
Peru	1,082	1,168	1,207	1,217	1,240
Philippines	968	1,075	1,378	1,475 ^r	1,400
Poland	9,336	9,161	10,540	10,336	9,065
Portugal	2,030	2,010	2,076	2,215	2,000
Qatar	2,594	2,521	2,645	2,575 ^r	2,558

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	2015	2016	2017	2018	2019
Romania	3,423	3,370	3,443	3,529 ^r	3,432
Russia	69,422	70,808	71,300	71,682 ^r	71,570
Rwanda ^e	15	19	23	23	23
Saudi Arabia	5,230 ^e	5,461	4,831	5,240	5,095
Serbia	955	1,173	1,477	1,973	1,929
Singapore	501	520	596	618 ^r	600 ^e
Slovakia	4,562	4,808	4,974	5,225	5,300
Slovenia	604	613	648	654	645
South Africa	6,417	6,141	6,301	6,327	5,666
Spain	14,845	13,616	14,444	14,320 ^r	13,581
Sweden	4,370 ^e	4,617 ^r	4,926	4,654	4,721
Switzerland	1,475 ^r	1,500	1,450	1,500 ^e	1,500
Syria ^e	5	5	5	5	5
Taiwan	21,392	21,751	22,438	23,240 ^r	22,065
Tanzania ^e	210	230	250	300 ^r	300
Thailand	3,720	3,824	4,471	6,403 ^r	4,190
Trinidad and Tobago	267	--	--	--	--
Tunisia	50	92	74 ^r	84 ^r	64
Turkey	31,517	33,163	37,524	37,312	33,743
Uganda	120 ^{r,e}	140 ^{r,e}	165 ^r	170 ^{r,e}	165 ^e
Ukraine	22,935	24,197	21,334	21,060 ^r	20,848
United Arab Emirates	3,006	3,149	3,309	3,247	3,327
United Kingdom	10,907	7,635	7,491	7,268 ^r	7,225
United States	78,800	78,500	81,600	86,600	87,800
Uruguay	97	61	60 ^r	60	62
Uzbekistan	643	654	657	646 ^r	625
Venezuela	1,345	553	444	129	50
Vietnam	4,093	7,805	11,473	17,723	14,008
Zambia	52	45	54 ^e	75 ^e	75 ^e
Total	1,610,000 ^r	1,630,000	1,730,000 ^r	1,810,000	1,860,000

^eEstimated. ^rRevised. -- Zero.

¹Table includes data available through August 20, 2020. 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.

⁴Figures reported by the State Statistical Bureau that the Government of China considers as official statistical data.