

## MANGANESE

(Data in thousand metric tons gross weight unless otherwise noted)

**Domestic Production and Use:** Manganese ore containing 20% or more manganese has not been produced domestically since 1970. Manganese ore was consumed mainly by eight firms with plants principally in the East and Midwest. Most ore consumption was related to steel production, either directly in pig iron manufacture or indirectly through upgrading the ore to ferroalloys. Additional quantities of ore were used for such nonmetallurgical purposes as production of dry cell batteries, in fertilizers and animal feed, and as a brick colorant. Manganese ferroalloys were produced at two plants. Construction, transportation, and machinery end uses accounted for about 43%, 13%, and 11%, respectively, of manganese consumption on a manganese-content basis. Most of the rest went to a variety of other iron and steel applications. In 2019, the value of domestic consumption, estimated from foreign trade data on a manganese-content basis, was about \$1.2 billion.

<b>Salient Statistics—United States:</b> <sup>1</sup>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019<sup>e</sup></b>
Production, mine	—	—	—	—	—
Imports for consumption:					
Manganese ore	441	282	297	440	340
Ferromanganese	292	229	331	427	370
Silicomanganese <sup>2</sup>	301	264	351	412	370
Exports:					
Manganese ore	1	1	1	3	1
Ferromanganese	5	7	9	10	7
Silicomanganese	1	2	8	4	1
Shipments from Government stockpile: <sup>3</sup>					
Manganese ore	—	—	—	—	—
Ferromanganese	32	42	9	10	5
Consumption, reported:					
Manganese ore <sup>4</sup>	451	410	378	370	380
Ferromanganese	344	342	345	348	360
Silicomanganese	138	139	141	139	140
Consumption, apparent, manganese <sup>5</sup>	693	545	714	793	740
Price, average, 46% to 48% Mn metallurgical ore, dollars per metric ton unit, contained Mn:					
Cost, insurance, and freight (c.i.f.), U.S. ports <sup>e</sup>	3.53	3.41	6.43	7.17	6.60
China spot market (c.i.f.)	3.22	4.48	<sup>6</sup> 5.62	<sup>6</sup> 6.91	<sup>7</sup> 6.16
Stocks, producer and consumer, yearend: <sup>4</sup>					
Manganese ore	187	207	148	185	150
Ferromanganese	21	21	17	27	28
Silicomanganese	21	10	11	21	22
Net import reliance <sup>8</sup> as a percentage of apparent consumption	100	100	100	100	100

**Recycling:** Manganese was recycled incidentally as a constituent of ferrous and nonferrous scrap; however, scrap recovery specifically for manganese was negligible. Manganese is recovered along with iron from steel slag.

**Import Sources (2015–18):** Manganese ore: Gabon, 70%; South Africa, 17%; Australia, 6%; Mexico, 5%; and other, 2%. Ferromanganese: South Africa, 27%; Australia, 19%; Norway, 16%; Republic of Korea, 13%; and other, 25%. Silicomanganese: Georgia, 27%; South Africa, 24%; Australia, 20%; Mexico, 8%; and other, 21%. Manganese contained in principal manganese imports:<sup>9</sup> South Africa, 22%; Gabon, 21%; Australia, 15%; Georgia, 10%; and other, 32%.

<b>Tariff:</b>	<b>Item</b>	<b>Number</b>	<b>Normal Trade Relations 12–31–19</b>
	Ores and concentrates	2602.00.0040/60	Free.
	Manganese dioxide	2820.10.0000	4.7% ad val.
	High-carbon ferromanganese	7202.11.5000	1.5% ad val.
	Ferrosilicon manganese (silicomanganese)	7202.30.0000	3.9% ad val.
	Metal, unwrought	8111.00.4700/4900	14% ad val.

**Depletion Allowance:** 22% (Domestic), 14% (Foreign).

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### Government Stockpile:<sup>10</sup>

Material	Inventory As of 9–30–19	FY 2019		FY 2020	
		Potential Acquisitions	Potential Disposals	Potential Acquisitions	Potential Disposals
Manganese ore, metallurgical grade	292	—	292	—	292
Ferromanganese, high-carbon	193	—	45	—	45
Manganese metal, electrolytic	0.432	3	—	5	—

**Events, Trends, and Issues:** U.S. manganese apparent consumption was estimated to have decreased by 7% to 740,000 tons in 2019 compared with that in 2018 as a result of decreases in U.S. ferromanganese and silicomanganese imports. Electrolytic manganese metal was newly added to the National Defense Stockpile in 2019 as a critical material for defense purposes; the last time electrolytic manganese metal was held in the Government stockpile was in 2004.

**World Mine Production and Reserves (manganese content):** Reserves for Australia, Brazil, Gabon, India, and South Africa were revised based on Government and industry sources.

	Mine production		Reserves <sup>11</sup>
	2018	2019 <sup>e</sup>	
United States	—	—	—
Australia	3,480	3,200	<sup>12</sup> 100,000
Brazil	1,310	1,200	140,000
Burma	207	210	NA
China	1,200	1,300	54,000
Cote d'Ivoire	395	400	NA
Gabon	2,330	2,400	61,000
Georgia	200	200	NA
Ghana	1,360	1,400	13,000
India	961	1,000	34,000
Kazakhstan, concentrate	140	130	5,000
Malaysia	390	420	NA
Mexico	210	190	5,000
South Africa	5,800	5,500	260,000
Ukraine, concentrate	517	540	140,000
Other countries	397	910	Small
World total (rounded)	18,900	19,000	810,000

**World Resources:** Land-based manganese resources are large but irregularly distributed; those in the United States are very low grade and have potentially high extraction costs. South Africa accounts for about 74% of the world's identified manganese resources, and Ukraine accounts for about 10%.

**Substitutes:** Manganese has no satisfactory substitute in its major applications.

<sup>e</sup>Estimated. NA Not available. — Zero.

<sup>1</sup>Manganese content typically ranges from 35% to 54% for manganese ore and from 74% to 95% for ferromanganese.

<sup>2</sup>Imports more nearly represent amount consumed than does reported consumption.

<sup>3</sup>Defined as stockpile shipments – receipts, thousand tons, manganese content. If receipts, a negative quantity is shown.

<sup>4</sup>Exclusive of ore consumed directly at iron and steel plants and associated yearend stocks.

<sup>5</sup>Defined as imports – exports + adjustments for Government and industry stock changes, thousand tons, manganese content. Based on estimates of average content for all significant components—including ore, manganese dioxide, ferromanganese, silicomanganese, and manganese metal—except imports, for which content is reported.

<sup>6</sup>For average metallurgical-grade ore containing 44% manganese, as reported by CRU Group.

<sup>7</sup>Average weekly price through September 2019 for average metallurgical-grade ore containing 44% manganese, as reported by CRU Group.

<sup>8</sup>Defined as imports – exports + adjustments for Government and industry stock changes, thousand tons, manganese content.

<sup>9</sup>Includes imports of ferromanganese, manganese ore, silicomanganese, synthetic manganese dioxide, and unwrought manganese metal.

<sup>10</sup>See Appendix B for definitions.

<sup>11</sup>See Appendix C for resource and reserve definitions and information concerning data sources.

<sup>12</sup>For Australia, Joint Ore Reserves Committee-compliant reserves were 45 million tons of manganese content.