

MANGANESE

(Data in thousand metric tons, gross weight, unless otherwise specified)

Domestic Production and Use: Manganese ore containing 35% or more manganese was not produced domestically in 1997. Manganese ore was consumed mainly by about 15 firms with plants principally in the Eastern and Midwestern United States. The majority of ore consumption was related to steel production, directly in pig iron manufacture and indirectly through upgrading ore to ferroalloys and metal. Ore was used otherwise for such nonmetallurgical purposes as producing dry cell batteries, as an ingredient in plant fertilizers and animal feed, and as a colorant for brick. Leading identifiable end uses of manganese were construction, machinery, and transportation, which were estimated to be 23%, 14%, and 11%, respectively, of total manganese demand. Most of the rest went to a variety of other iron and steel applications. Value of domestic consumption was estimated from foreign trade data as about \$420 million.

Salient Statistics—United States:¹	1993	1994	1995	1996	1997^e
Production, mine ²	—	—	—	—	—
Imports for consumption:					
Manganese ore	232	331	394	478	380
Ferromanganese	347	336	374	350	310
Silicomanganese ³	316	273	305	323	275
Exports:					
Manganese ore	16	15	15	32	54
Ferromanganese	18	11	11	10	9
Shipments from Government stockpile excesses: ⁴					
Manganese ore	254	134	115	128	123
Ferromanganese	(1)	9	18	(2)	38
Consumption, reported: ⁵					
Manganese ore ⁶	389	449	486	478	485
Ferromanganese	341	347	348	315	330
Consumption, apparent, manganese ⁷	696	694	676	776	715
Price, average value, 46% to 48% Mn metallurgical ore, dollars per mtu cont. Mn, c.i.f. U.S. ports	2.60	2.40	2.40	2.55	2.44
Stocks, producer and consumer, yearend:					
Manganese ore ⁶	302	269	309	319	200
Ferromanganese	30	36	33	27	17
Net import reliance ⁸ as a percent of apparent consumption	100	100	100	100	100

Recycling: Scrap recovery specifically for manganese was negligible, but a significant amount was recycled through processing operations as a minor component of ferrous and nonferrous scrap and steel slag.

Import Sources (1993-96): Manganese ore: Gabon, 58%; Australia, 18%; Mexico, 11%; South Africa, 7%; and other, 6%. Ferromanganese: South Africa, 38%; France, 26%; Brazil, 10%; Australia, 8%; and other, 18%. Manganese contained in all manganese imports: South Africa, 28%; Gabon, 16%; Australia, 13%; France, 12%; and other, 31%.

Tariff: Item	Number	Most favored nation (MFN) 12/31/97	Non-MFN⁹ 12/31/97
Ore and concentrate	2602.00.0040/60	Free	2.2¢/kg of contained Mn.
Manganese dioxide	2820.10.0000	4.7% ad val.	25% ad val.
High-carbon ferromanganese	7202.11.5000	1.5% ad val.	10.5% ad val.
Silicomanganese	7202.30.0000	3.9% ad val.	23% ad val.
Metal, unwrought	8111.00.4500	14% ad val.	20% ad val.

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

Government Stockpile: In addition to the data tabulated, the stockpile contained additional uncommitted inventories of nonstockpile-grade materials, as follows, in tons: natural battery ore, 16,800; chemical ore, 81; and metallurgical ore, 427,000.

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Stockpile Status—9-30-97¹⁰

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 1997	Disposals FY 1997
Battery: Natural ore	107	0.7	107	54	8
Synthetic dioxide	3	—	3	—	—
Chemical ore	148	—	148	36	2
Metallurgical ore	778	26	526	363	111
Ferromanganese:					
High-carbon	940	4	695	45	27
Medium-carbon	13	3	—	—	5
Silicomanganese	—	0.005	—	—	0.2
Electrolytic metal	9	0.5	9	2	1

Events, Trends, and Issues: Although raw steel production, a major determinant of manganese demand, was trending up slightly in the United States and firmly on a global basis, prices decreased to lower levels for manganese ore and the principal manganese ferroalloys. Impending production of refined manganese ferroalloys by joint ventures between Japanese and South African companies foreshadowed strong competition in that sector of the manganese industry. Manganese is an essential element for people, animals, and plants, but it can be harmful in excessive amounts. Thus, manganese can be an industrial poison, but generally is not a hazard.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves ¹¹	Reserve base ¹¹
	1996	1997 ^e		
United States	—	—	—	—
Australia	1,020	1,000	30,000	80,000
Brazil	858	860	21,000	56,000
China	1,200	1,200	40,000	100,000
Gabon	923	930	45,000	150,000
Georgia	29	30	7,000	49,000
India	659	630	24,000	36,000
Mexico	173	175	4,000	9,000
South Africa	1,380	1,320	370,000	4,000,000
Ukraine	1,020	930	135,000	520,000
Other countries	466	450	Small	Small
World total (rounded)	7,730	7,500	680,000	5,000,000

World Resources: Land-based resources are large but irregularly distributed; those of the United States are very low grade and have potentially high extraction costs. South Africa and the Former Soviet Union (FSU) account for more than 80% of the world's identified resources; South Africa accounts for more than 80% of the total exclusive of China and the FSU.

Substitutes: There is no satisfactory substitute for manganese in its major applications.

^eEstimated. ^rRevised

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

²Excludes insignificant quantities of low-grade manganiferous ore.

³Imports more nearly represent amount consumed than does reported consumption; internal evaluation indicates that reported consumption of silicomanganese is considerably understated.

⁴Net quantity including effect of stockpile upgrading program. Data in parentheses denote increases in inventory.

⁵Total manganese consumption cannot be approximated from consumption of manganese ore and ferromanganese because of the use of ore in making manganese ferroalloys and metal.

⁶For 1996-97, exclusive of that at iron and steel plants.

⁷Thousand metric tons, manganese content. Based on estimates of average content for all significant components except imports, for which content is reported.

⁸Defined as imports - exports + adjustments for Government and industry stock changes.

⁹See Appendix B.

¹⁰See Appendix C for definitions.

¹¹Thousand metric tons, manganese content. See Appendix D for definitions.