CHROMIUM

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

Domestic Production and Use: The United States consumes about 16% of world chromite ore production in various forms of imported materials (chromite ore, chromium ferroalloys, chromium metal, and chromium chemicals). Imported chromite was consumed by two chemical firms, one metallurgical firm, and four refractory firms to produce chromium chemicals, chromium ferroalloys, and chromite-containing refractories, respectively. Consumption of chromium ferroalloys and metal by end use was: stainless and heat-resisting steel, 74%; full-alloy steel, 10%; superalloys, 3%; and others, 13%. The value of chromium materials consumption was about $430 million. Secondary chromium is recovered from stainless steel scrap.

Salient Statistics—United States:[1]	1992	1993	1994	1995	1996[e]
Production: Mine	—	—	—	—	—
Secondary	102	92	99	113	104
Imports for consumption	324	330	273	416	400
Exports	18	21	33	27	63
Government stockpile releases	(30)	68	49	44	41
Consumption: Reported (excludes secondary)	334	327	310	298	264
Apparent[2] (includes secondary)	378	484	390	566	497
Price, chromite, yearend:					
Turkish, dollars per metric ton, Turkey	110	110	110	230	230
South African, dollars per metric ton, South Africa	60	60	60	80	80
Stocks, industry, yearend	118	103	101	80	65
Net import reliance[3] as a percent of apparent consumption	73	81	75	80	79

Recycling: In 1996, chromium contained in purchased stainless steel scrap accounted for 21% of demand.

Import Sources (1992-95): Chromium contained in chromite ore and chromium ferroalloys and metal: South Africa, 37%; Turkey, 15%; Russia ,11%; Kazakstan, 6%; Zimbabwe, 6%; and other, 25%.

Tariff:[4] Item	Number	Most favored nation (MFN) 12/31/96	Non-MFN[5] 12/31/96
Ore and concentrate	2610.00.0000	Free	Free.
Ferrochromium, high-carbon	7202.41.0000	1.9% ad val.	7.5% ad val.

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

Government Stockpile: The National Defense Stockpile Agency submitted the Annual Materials Plan for 1997 in February 1996. Congress passed the plan in September. The plan was to become effective in November 1996. The plan set maximum amounts of material that may be sold as follows: chromite ore, 90,700 tons of chemical grade, 227,000 tons of metallurgical grade, and 90,700 tons of refractory grade; chromium ferroalloys, 31,800 tons.

Stockpile Status—9-30-96

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposals Jan.-Sept. 96	Average chromium content
Chromite ore:					
Chemical-grade	175	44.7	122	—	28.6%
Metallurgical-grade	384	259	384	[6](51.9)	28.6%
Refractory-grade	231	90.7	85.7	9.98	[e]23.9%
Chromium ferroalloys:					
Ferrochromium:					
High-carbon	695	39.0	399	39.0	71.4%
Low-carbon	283	—	—	—	71.4%
Ferrochromium-silicon	52.7	2	—	0.255	42.9%
Chromium metal	7.72	—	—	—	[e]100%

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Events, Trends, and Issues: Chromite ore is not produced in the United States, Canada, or Mexico. Chromite ore is produced in the Western Hemisphere only in Brazil and Cuba. Virtually all of Brazilian production is consumed in Brazil. Cuban production is small. The two largest chromite ore producers, accounting for about two-thirds of world production, Kazakstan and South Africa, are both currently undergoing major political change. Economic and political reorganization in the former Soviet Union has resulted in reduced demand. This lull in demand may be followed by strong growth-driven demand resulting from the institution of reforms in those countries. South Africa has been the major supplier of chromite ore to Western industrialized countries. In 1995, prices recovered from having been suppressed by excess production capacity resulting from the dissolution of the U.S.S.R.[7] in 1991 and excess ferrochromium capacity resulting from expansion worldwide during 1990-92. Western economy demand remains firm while industry restructures. Chromium markets weakened in 1996 as the stainless steel industry adjusted after 2 consecutive years of growth in excess of 10%.

Chromium releases into the environment are regulated by the U.S. Environmental Protection Agency. Workplace exposure is regulated by the U.S. Occupational Safety and Health Administration.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves[8]	Reserve base[8]
	1995	1996[e]	(shipping grade)[9]	
United States	—	—	—	10,000
Albania	250	250	6,100	6,100
Brazil	360	350	14,000	23,000
Finland	610	600	38,000	46,000
India	1,230	1,100	27,000	67,000
Iran	129	100	2,400	2,400
Kazakstan	2,400	2,400	320,000	320,000
Russia	151	150	4,000	460,000
South Africa	5,100	5,000	3,100,000	5,500,000
Turkey	800	800	8,000	20,000
Zimbabwe	631	600	140,000	930,000
Other countries	368	350	29,000	37,000
World total (may be rounded)	12,000	12,000	3,700,000	7,500,000

World Resources: World resources exceed 11 billion tons of shipping-grade chromite, sufficient to meet conceivable demand for centuries. About 95% of chromium resources are geographically concentrated in southern Africa. Reserves and reserve base are geographically concentrated in southern Africa and Kazakstan. The largest U.S. chromium resource is in the Stillwater Complex in Montana.

Substitutes: There is no substitute for chromite ore in the production of ferrochromium, chromium chemicals, or chromite refractories. There is no substitute for chromium in stainless steel, the major end use, or for chromium in superalloys, the major strategic end use. Chromium-containing scrap can substitute for ferrochromium in metallurgical uses. Substitutes for chromium-containing alloys, chromium chemicals, and chromite refractories generally increase cost or limit performance. According to the National Academy of Sciences, substituting chromium-free materials for chromium-containing products could save about 60% of chromium used in alloying metals, about 15% of chromium used in chemicals, and 90% of chromite used in refractories, given 5 to 10 years to develop technically acceptable substitutes and to accept increased cost.

[e]Estimated.

[1]Data in thousand metric tons of contained chromium, unless noted otherwise.

[2]Calculated demand for chromium is production + imports - exports + stock adjustment.

[3]Defined as imports - exports + adjustments for Government and industry stock changes.

[4]In addition to the tariff items listed, certain imported chromium materials (see U.S. Code, chapter 26, sections 4661 and 4672) are subject to excise tax.

[5]See Appendix B.

[6]Reinstatement of previously sold material.

[7]As constituted before Dec. 1991.

[8]See Appendix C for definitions. Reserves and reserve base data are rounded to no more than two significant figures.

[9]Shipping-grade chromite ore is deposit quantity and grade normalized to 45% Cr_2O_3.