CHROMIUM

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

Domestic Production and Use: In 2001, the United States consumed about 14% of world chromite ore production in various forms of imported materials, such as chromite ore, chromium chemicals, chromium ferroalloys, and chromium metal. Imported chromite was consumed by two chemical firms and two refractory firms to produce chromium chemicals and chromite-containing refractories, respectively. Consumption of chromium ferroalloys and metal was predominantly for the production of stainless and heat-resisting steel and superalloys, respectively. The value of chromium material consumption was about $327 million.

Salient Statistics—United States:[1]	1997	1998	1999	2000	2001[e]
Production, secondary	120	104	118	139	120
Imports for consumption	350	385	476	453	420
Exports	30	62	60	86	60
Government stockpile releases	47	93	19	85	60
Consumption:					
Reported[2] (excludes secondary)	333	277	298	206	280
Apparent[3] (includes secondary)	490	531	558	589	540
Price, chromite, yearend:					
South African, dollars per metric ton, South Africa	73	68	63	63	NA
Turkish, dollars per metric ton, Turkey	180	145	145	145	NA
Unit value, average annual import (dollars per metric ton):					
Chromite ore (gross weight)	74	74	62	64	65
Ferrochromium (chromium content)	1,212	1,027	732	797	800
Chromium metal (gross weight)	7,419	7,576	6,267	5,982	6,000
Stocks, industry, yearend	71	56	54	16	15
Net import reliance[4] as a percentage of apparent consumption	75	80	79	67	78

Recycling: In 2001, chromium contained in purchased stainless steel scrap accounted for 22% of apparent consumption.

Import Sources (1997-2000): Chromium contained in chromite ore and chromium ferroalloys and metal: South Africa, 48%; Kazakhstan, 16%; Russia, 9%; Turkey, 9%; Zimbabwe, 9%; and other, 9%.

Tariff:[5] Item	Number	Normal Trade Relations 12/31/01
Ore and concentrate	2610.00.0000	Free.
Ferrochromium, high-carbon	7202.41.0000	1.9% ad val.
Chromium metal	8112.20.6000	3% ad val.

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

Government Stockpile: The Defense Logistics Agency, U.S. Department of Defense, submitted the Annual Materials Plan for 2002 in February 2001. In addition to the stockpile-grade uncommitted inventory listed below, the stockpile contained the following nonstockpile-grade uncommitted inventory, in thousand metric tons: metallurgical chromite ore, 33; high-carbon ferrochromium, 0.601; low-carbon ferrochromium, 6.89; and ferrochromium silicon, 7.28.

Stockpile Status—9-30-01[6]

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 2001	Disposals FY 2001	Average chromium content
Chromite ore:						
Chemical-grade	192	6.16	192	90.7	—	28.6%
Metallurgical-grade	62.0	67.1	62.0	227	12.7	28.6%
Refractory-grade	202	16.9	202	90.7	12.8	[e]23.9%
Chromium ferroalloys:						
Ferrochromium:						
High-carbon	560	39.7	560	136	—	71.4%
Low-carbon	237	4.24	237	—	18.6	71.4%
Ferrochromium-silicon	9.37	3.33	9.37	—	2.47	42.9%
Chromium metal	7.28	0.021	4.10	0.454	0.124	[e]100%

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CHROMIUM

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. Most of Brazilian production is consumed in Brazil; some is exported to Norway. Cuban production is small. The largest chromite-ore-producing countries (India, Kazakhstan, South Africa, and Turkey) accounted for about 80% of world production. South Africa alone accounts for more than 40% of world production and has been the major supplier of chromium in the form of chromite ore and ferrochromium to Western industrialized countries. Stainless steel, the major end use market for chromium, has shown long-term growth equivalent to about one or two new ferrochromium furnaces per year. To meet this demand, South African plants were built or expanded. Production capacity was then expanded through the addition of furnaces and plant enhancements that improved recovery and reduced cost, such as agglomeration, preheating of furnace feed, and recovery from slag. South African chromite ore and ferrochromium producers financed these process changes through joint ventures with stainless steel producers in Asia. By financing capacity growth and production efficiency, consumers have lowered their cost and secured their supply, and producers have secured market share and stabilized production rates. With existing South African plants efficiently meeting current (2001) demand, a new round of plant development and furnace additions is expected in Kazakhstan and South Africa to meet anticipated demand growth.

The U.S. Environmental Protection Agency regulates chromium releases into the environment. The U.S. Occupational Safety and Health Administration regulates workplace exposure.

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves[7]	Reserve base[7]
	2000	2001[e]	(shipping grade)[8]	
United States	—	—	—	10,000
India	1,500	1,500	26,000	57,000
Kazakhstan	2,610	2,300	320,000	320,000
South Africa	6,620	5,400	3,000,000	5,500,000
Turkey	1,000	500	8,000	20,000
Other countries	2,640	2,300	250,000	1,600,000
World total (rounded)	14,400	12,400	3,600,000	7,600,000

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

Substitutes: Chromite ore has no substitute in the production of ferrochromium, chromium chemicals, or chromite refractories. Chromium has no substitute in stainless steel, the largest 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. In 1978, the National Academy of Sciences found that 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. NA Not available. — Zero.

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

[2]The years 1997 through 1998 include chromite ore; 1999 through 2001 exclude chromite ore.

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

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

[5]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.

[6]See Appendix B for definitions.

[7]See Appendix C for definitions.

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