

CHROMIUM

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

Domestic Production and Use: In 2002, 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 \$317 million.

Salient Statistics—United States: ¹	1998	1999	2000	2001	2002^e
Production, secondary	104	118	139	122	153
Imports for consumption	385	476	453	239	174
Exports	62	60	86	38	10
Government stockpile releases	93	19	85	9	87
Consumption:					
Reported ² (excludes secondary)	277	298	206	196	212
Apparent ³ (includes secondary)	531	558	589	332	413
Price, chromite, yearend:					
South African, dollars per metric ton, South Africa	68	63	63	NA	NA
Turkish, dollars per metric ton, Turkey	145	145	145	NA	NA
Unit value, average annual import (dollars per metric ton):					
Chromite ore (gross weight)	74	62	64	61	50
Ferrochromium (chromium content)	1,027	732	797	709	610
Chromium metal (gross weight)	7,569	6,267	5,976	6,116	5,820
Stocks, industry, yearend ⁴	56	54	16	17	8
Net import reliance ⁵ as a percentage of apparent consumption	80	79	67	61	63

Recycling: In 2002, chromium contained in purchased stainless steel scrap accounted for 37% of apparent consumption.

Import Sources (1998-2001): Chromium contained in chromite ore and chromium ferroalloys and metal: South Africa, 50%; Kazakhstan, 20%; Zimbabwe, 9%; Turkey, 7%; Russia, 6%; and other, 8%.

Tariff: ⁶	Item	Number	Normal Trade Relations 12/31/02
	Ore and concentrate	2610.00.0000	Free.
	Ferrochromium, high-carbon	7202.41.0000	1.9% ad val.
	Chromium metal	8112.29.0000	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 2003 in February 2002. Actual quantity available for sale will be limited to sales authority or inventory.

Stockpile Status—9-30-02⁷

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 2002	Disposals FY 2002	Average chromium content
Chromite ore:						
Chemical-grade	78.3	4.38	78.3	90.7	114	28.6%
Metallurgical-grade	—	83.4	—	90.7	—	28.6%
Refractory-grade	113	63.4	113	90.7	89.0	^e 23.9%
Chromium ferroalloys:						
Ferrochromium:						
High-carbon	544	10.7	544	136	17.0	71.4%
Low-carbon	234	2.69	234	—	9.30	71.4%
Ferrochromium-silicon	—	—	—	—	9.60	42.9%
Chromium metal	7.22	—	7.22	0.454	—	^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. Most of Brazilian production is consumed in Brazil. Cuban production is small. The largest chromite-ore-producing countries (India, Kazakhstan, and South Africa) accounted for about 76% of world production. South Africa alone accounts for more than 45% of world production and has been the major supplier of chromium in the form of chromite ore and ferrochromium to Western industrialized countries.

World Mine Production, Reserves, and Reserve Base: The reserves and reserve base estimates have been revised from those previously published based on new information.

	Mine production		Reserves ⁸ (shipping grade) ⁹	Reserve base ⁸
	2001	2002 ^e		
United States	—	—	—	7,000
India	1,680	1,900	18,000	39,000
Kazakhstan	2,050	2,300	410,000	410,000
South Africa	5,500	5,800	790,000	5,500,000
Other countries	2,900	3,000	420,000	1,100,000
World total (rounded)	12,100	13,000	1,600,000	7,100,000

World Resources: World resources exceed 12 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.

^eEstimated. NA Not available. — Zero.

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

²The year 1998 includes chromite ore; 1999 through 2002 exclude chromite ore.

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

⁴Includes producer and consumer stocks before 2000; consumer stocks after 1999.

⁵Defined as imports - exports + adjustments for Government and industry stock changes.

⁶In 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.

⁷See Appendix B for definitions.

⁸See Appendix C for definitions.

⁹Shipping-grade chromite ore is deposit quantity and grade normalized to 45% Cr₂O₃.