

CHROMIUM

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

Domestic Production and Use: In 2009, the United States was expected to consume about 7% of world chromite ore production in various forms of imported materials, such as chromite ore, chromium chemicals, chromium ferroalloys, chromium metal, and stainless steel. One U.S. company mined chromite ore in Oregon. Imported chromite was consumed by one chemical firm to produce chromium chemicals. One company produced ferrochromium and chromium metal. Stainless- and heat-resisting-steel producers were the leading consumers of ferrochromium. Superalloys require chromium. The value of chromium material consumption in 2008 was \$1,283 million as measured by the value of net imports, excluding stainless steel, and was expected to be about \$320 million in 2009.

Salient Statistics—United States:¹	2005	2006	2007	2008	2009^e
Production:					
Mine	—	—	W	—	—
Recycling ²	174	179	162	146	160
Imports for consumption	503	520	485	559	150
Exports	220	212	291	287	50
Government stockpile releases	91	103	137	11	1
Consumption:					
Reported (includes recycling)	431	437	442	404	330
Apparent ³ (includes recycling)	548	589	493	432	260
Unit value, average annual import (dollars per metric ton):					
Chromite ore (gross mass)	140	141	156	227	220
Ferrochromium (chromium content)	1,425	1,290	1,951	3,728	2,100
Chromium metal (gross mass)	8,007	8,181	8,331	11,078	10,000
Stocks, yearend, held by U.S consumers	9	10	10	7	5
Net import reliance ⁴ as a percentage of apparent consumption	68	70	67	66	39

Recycling: In 2009, recycled chromium (contained in reported stainless steel scrap receipts) accounted for 61% of apparent consumption.

Import Sources (2005-08): Chromium contained in chromite ore, chromium ferroalloys and metal, and stainless steel mill products and scrap: South Africa, 32%; Kazakhstan, 17%; Russia, 9%; and other, 42%.

Tariff:⁵ Item	Number	Normal Trade Relations 12-31-09
Ore and concentrate	2610.00.0000	Free.
Ferrochromium:		
Carbon more than 4%	7202.41.0000	1.9% ad val.
Carbon more than 3%	7202.49.1000	1.9% ad val.
Other:		
Carbon more than 0.5%	7202.49.5010	3.1% ad val.
Other	7202.49.5090	3.1% ad val.
Ferrochromium silicon	7202.50.0000	10% ad val.
Chromium metal:		
Unwrought, powder	8112.21.0000	3% ad val.
Waste and scrap	8112.22.0000	Free.
Other	8112.29.0000	3% ad val.

Depletion Allowance:⁶ 22% (Domestic), 14% (Foreign).

Government Stockpile: In fiscal year (FY) 2009, which ended on September 30, 2009, the Defense Logistics Agency, Defense National Stockpile Center (DNSC), reported sales of 17,766 tons of high-carbon ferrochromium, 2,778 tons of low-carbon ferrochromium, and 120 tons of chromium metal. Disposals in the following table are estimated as the change in DNSC's reported current year minus previous year physical inventory. Metallurgical-grade chromite ore and ferrochromium silicon stocks were exhausted in FY 2002; chemical- and refractory-grade chromite ore stocks were exhausted in FY 2004. The DNSC announced maximum disposal limits for FY 2010 of about 90,700 tons of ferrochromium (high- and low-carbon combined) and 907 tons of chromium metal. At the current maximum disposal rate, ferrochromium stocks will be exhausted in FY 2011; chromium metal, in FY 2014.

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Stockpile Status—9-30-09⁶

Material	Uncommitted inventory	Authorized for disposal	Disposal plan FY 2009	Disposals FY 2009	Average chromium content
Ferrochromium:					
High-carbon	115	139	⁷ 136	24.7	71.4%
Low-carbon	57.9	66.7	(7)	8.83	71.4%
Chromium metal	4.70	4.82	0.907	0.120	100%

Events, Trends, and Issues: The price of ferrochromium reached historically high levels in 2008, and then declined in 2009 with a weakening world economy. China's role as a chromium consumer grew along with its stainless steel production industry. China's importance as a consumer of raw materials used in stainless steel production increased owing to its strong economic growth and the expansion of its stainless steel production.

Ferrochromium production is an electrical energy-intensive process. South Africa, which accounts for about 40% of world chromite ore and ferrochromium production, experienced electrical power shortages that South Africa's electrical power utility dealt with by rationing. Indian ferrochromium producers, which accounted for about 15% of world ferrochromium production, dealt with limited electrical power supply by putting up dedicated electrical powerplants. Kazakhstan, which accounted for about 15% of world ferrochromium production, expected increasing electrical power demand and reduced production capacity owing to aging infrastructure. World financial problems relieved electrical power demand; however, with economic recovery, the electrical power supply constraint will return unless electrical power capacity is increased.

Much of the electrical power currently produced is coal-based, a carbon dioxide gas-producing process that is currently being considered for regulation because of its impact on global warming. These factors suggest that the electrical energy cost of ferrochromium production will rise in the future.

World Mine Production and Reserves: Reserves for South Africa were revised based on new information published by a mining company. Reserves for the United States were revised based on new information published by a mining company.

	Mine production ⁸		Reserves ⁹ (shipping grade) ¹⁰
	2008	2009 ^e	
United States	—	—	620
India	3,900	3,900	44,000
Kazakhstan	3,630	3,600	180,000
South Africa	9,680	9,600	130,000
Other countries	<u>6,540</u>	<u>6,300</u>	NA
World total (rounded)	23,800	23,000	>350,000

World Resources: World resources are greater than 12 billion tons of shipping-grade chromite, sufficient to meet conceivable demand for centuries. About 95% of the world's chromium resources is geographically concentrated in Kazakhstan and southern Africa; U.S. chromium resources are mostly in the Stillwater Complex in Montana.

Substitutes: Chromium has no substitute in stainless steel, the leading end use, or in superalloys, the major strategic end use. Chromium-containing scrap can substitute for ferrochromium in some metallurgical uses.

⁶Estimated. NA Not available. W Withheld to avoid disclosing company proprietary data. — Zero.

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

²Recycling production is based on reported stainless steel scrap receipts.

³Calculated consumption of chromium; equal to production (from mines and recycle) + imports – exports + stock adjustments.

⁴Defined as imports – exports + adjustments for Government and industry stock changes.

⁵In addition to the tariff items listed, certain imported chromium materials (see 26 U.S.C. sec. 4661, 4662, and 4672) are subject to excise tax.

⁶See Appendix B for definitions.

⁷Disposal plan for ferrochromium without distinction between high-carbon and low-carbon ferrochromium; total included in high-carbon.

⁸Mine production units are thousand metric tons, gross weight, of marketable chromite ore.

⁹See Appendix C for definitions. Reserve base estimates were discontinued in 2009; see Introduction. Proven reserves and probable reserves reported by mining companies previously reported as reserves and reserve base, respectively, have been combined into the reserves category.

¹⁰Reserves units are thousand metric tons of shipping-grade chromite ore, which is deposit quantity and grade normalized to 45% Cr₂O₃.