

CHROMIUM

(Data in thousand metric tons of contained chromium unless otherwise noted)

Domestic Production and Use: In 2022, the United States consumed an estimated 5% of world chromite ore production in various forms of imported materials, such as chromite ore, chromium chemicals, chromium ferroalloys, chromium metal, and stainless steel. Imported chromite ore was consumed by one chemical company to produce chromium chemicals. Stainless-steel and heat-resisting-steel producers were the leading consumers of ferrochromium. Stainless steels and superalloys require the addition of chromium via ferrochromium or chromium-containing scrap. The value of chromium material consumption was expected to be about \$1.5 billion in 2022, as measured by the value of net imports, excluding stainless steel, which was a 75% increase from \$874 million in 2021.

Salient Statistics—United States:	2018	2019	2020	2021	2022^e
Production:					
Mine	—	—	—	—	—
Recycling ¹	139	137	119	114	100
Imports for consumption ²	651	530	457	607	620
Exports ²	212	149	138	114	140
Shipments from Government stockpile ³	4	4	5	7	5
Consumption (includes recycling):					
Reported	459	482	386	375	310
Apparent ⁴	583	521	442	614	590
Price, average unit value of imports, dollars per metric ton:					
Chromite ore (gross weight)	279	248	179	197	340
Ferrochromium (chromium content) ⁵	2,549	2,094	1,878	2,837	6,800
Chromium metal (gross weight)	11,344	10,393	7,931	8,757	21,000
Stocks, consumer, yearend	5	5	6	6	6
Net import reliance ⁶ as a percentage of apparent consumption	76	74	73	81	83

Recycling: In 2022, recycled chromium (contained in reported stainless-steel scrap receipts) accounted for 17% of apparent consumption.

Import Sources (2018–21): Chromite (ores and concentrates): South Africa, 97%; Canada, 2%; and other, 1%. Chromium-containing scrap:⁷ Canada, 48%; Mexico, 42%; Netherlands, 4%; and other, 6%. Chromium (primary metal):⁸ South Africa, 30%; Kazakhstan, 13%; Russia, 9%; Germany, 7%; and other, 41%. Chromium-containing chemicals: China,⁹ 23%; Germany, 20%; Kazakhstan, 19%; and other, 38%. Total imports: South Africa, 37%; Kazakhstan, 10%; Russia, 7%; Germany, 6%; and other, 40%.

Tariff:¹⁰	Item	Number	Normal Trade Relations 12–31–22
	Chromium ores and concentrates:		
	Not more than 40% chromic oxide (Cr ₂ O ₃)	2610.00.0020	Free.
	More than 40% but less than 46% Cr ₂ O ₃	2610.00.0040	Free.
	More than or equal to 46% Cr ₂ O ₃	2610.00.0060	Free.
	Ferrochromium:		
	More than 4% carbon	7202.41.0000	1.9% ad valorem.
	More than 3% but less than 4% carbon	7202.49.1000	1.9% ad valorem.
	More than 0.5% but less than 3% carbon	7202.49.5010	3.1% ad valorem.
	Not more than 0.5% carbon	7202.49.5090	3.1% ad valorem.
	Ferrosilicon chromium	7202.50.0000	10% ad valorem.
	Chromium metal:		
	Unwrought, powder	8112.21.0000	3% ad valorem.
	Waste and scrap	8112.22.0000	Free.
	Other	8112.29.0000	3% ad valorem.

Depletion Allowance: 22% (domestic), 14% (foreign).

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Government Stockpile:^{11, 12}

<u>Material</u>	<u>Inventory as of 9–30–22</u>	<u>FY 2022</u>		<u>FY 2023</u>	
		<u>Potential acquisitions</u>	<u>Potential disposals</u>	<u>Potential acquisitions</u>	<u>Potential disposals</u>
Ferrochromium:					
High carbon	17.2	—	¹³ 21.8	—	¹³ 21.8
Low carbon	26.6	—	—	—	—
Chromium metal	3.47	—	0.454	—	0.454

Events, Trends, and Issues: South Africa was the leading chromite ore producer. Global chromite ore mine production was estimated to have decreased slightly in 2022, owing to constraints from operational challenges in some countries, slow global economic growth, and increasing labor costs. China was the leading ferrochromium- and stainless-steel-producing country and the leading chromium-consuming country. Coronavirus disease 2019 (COVID-19) pandemic-related lockdowns, tight financial conditions, and a decrease in demand could affect ferrochromium and stainless-steel production in China. The Bipartisan Infrastructure Law provided funding for a critical minerals mapping project, which includes chromium, that the U.S. Geological Survey Earth Mapping Resources Initiative will undertake.

From September 2021 to September 2022, the monthly average high-carbon ferrochromium price increased by 85%. The price of chromium metal increased by 36% in September 2022 compared with the monthly average price in September 2021.

World Mine Production and Reserves: Reserves for the United States were revised based on industry information. Reserves for Finland were revised based on Government reports.

	<u>Mine production</u> ¹⁴		<u>Reserves</u> ¹⁵
	<u>2021</u>	<u>2022^e</u>	<u>(shipping grade)</u> ¹⁶
United States	—	—	630
Finland	2,270	2,200	8,300
India	4,250	4,200	100,000
Kazakhstan ^e	6,500	6,500	230,000
South Africa	18,600	18,000	200,000
Turkey	6,960	6,900	26,000
Other countries	<u>3,620</u>	<u>3,500</u>	<u>NA</u>
World total (rounded)	42,200	41,000	560,000

World Resources:¹⁵ World resources are greater than 12 billion tons of shipping-grade chromite, sufficient to meet conceivable demand for centuries. World chromium resources are heavily geographically concentrated (95%) in Kazakhstan and southern Africa; United States 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.

^eEstimated. NA Not available. — Zero.

¹Recycling production is based on reported receipts of all types of stainless-steel scrap.

²Includes chromium chemicals, chromium metal, chromite ores, ferrochromium, and stainless-steel products and scrap.

³Defined as change in total inventory from prior yearend inventory. If negative, increase in inventory.

⁴Defined as production (from mines and recycling) + imports – exports ± adjustments for Government and industry stock changes.

⁵Excludes ferrochromium silicon.

⁶Defined as imports – exports ± adjustments for Government and industry stock changes.

⁷Includes chromium metal scrap and stainless-steel scrap.

⁸Includes chromium metal, ferrochromium, and stainless steel.

⁹Includes Hong Kong.

¹⁰In 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.

¹¹See Appendix B for definitions.

¹²Units are thousand metric tons, gross weight.

¹³High-carbon and low-carbon ferrochromium, combined.

¹⁴Units are thousand metric tons, gross weight, of marketable chromite ore.

¹⁵See Appendix C for resource and reserve definitions and information concerning data sources.

¹⁶Units are thousand metric tons of shipping-grade chromite ore, which is deposit quantity and grade normalized to 45% Cr₂O₃, except for the United States, where grade is normalized to 7% Cr₂O₃, and Finland, where grade is normalized to 26% Cr₂O₃.