

CHROMIUM

(Data in thousand metric tons, chromium content, unless otherwise specified)

Domestic Production and Use: In 2023, the United States consumed an estimated 4% of world chromite ore production in various forms of imported materials, such as chromite ore, chromium chemicals, ferrochromium, 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 estimated to be about \$830 million in 2023 (as measured by the value of net imports, excluding stainless steel), which was a 44% decrease from \$1.5 billion in 2022.

<u>Salient Statistics—United States:</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2022</u>	<u>2023^e</u>
Production:					
Mine	—	—	—	—	—
Secondary ¹	137	119	114	91	100
Imports for consumption ²	530	448	571	609	440
Exports ²	149	138	114	133	150
Shipments from Government stockpile ³	4	5	7	5	NA
Consumption (includes recycling):					
Reported	482	386	364	275	260
Apparent ⁴	522	433	579	573	380
Price: ⁵					
Chromite ore (gross weight), dollars per metric ton	174	154	201	274	290
Ferrochromium (chromium content), dollars per pound ⁶	1.00	0.90	1.56	3.21	3.50
Chromium metal (gross weight), dollars per pound	4.13	3.22	4.35	7.12	5.50
Stocks, consumer, yearend	5	6	6	5	5
Net import reliance ⁷ as a percentage of apparent consumption	74	73	80	84	74

Recycling: In 2023, recycled chromium (contained in reported stainless-steel scrap receipts) accounted for 26% of apparent consumption.

Import Sources (2019–22): Chromite (ores and concentrates): South Africa, 97%; Turkey, 2%; and other, 1%. Chromium-containing scrap:⁸ Canada, 52%; Mexico, 43%; United Kingdom, 1%; and other, 4%. Chromium (primary metal):⁹ South Africa, 28%; Kazakhstan, 15%; Russia, 8%; Finland, 5%; and other, 44%. Chromium-containing chemicals: Kazakhstan, 22%; Germany, 20%; China,¹⁰ 19%; Italy, 14%; and other, 25%. Total imports: South Africa, 34%; Kazakhstan, 12%; Russia, 6%; Canada, 5%; and other, 43%.

<u>Tariff:</u>	<u>Item</u>	<u>Number</u>	<u>Normal Trade Relations</u> <u>12–31–23</u>
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>FY 2023</u>		<u>FY 2024</u>	
	<u>Potential acquisitions</u>	<u>Potential disposals</u>	<u>Potential acquisitions</u>	<u>Potential disposals</u>
Ferrochromium:				
High carbon	—	¹³ 21.8	—	¹³ 21.8
Low carbon	—	—	—	—
Chromium metal	—	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 2023 compared with production in 2022. Production in South Africa, the world's leading producer of chromite, decreased by an estimated 6% compared with production in 2022 owing to disruptions to the supply of electricity and problems with transportation of ore via rail. China was the leading ferrochromium- and stainless-steel-producing country and the leading chromium-consuming country.

World Mine Production and Reserves: Reserves for India and Turkey were revised based on Government reports.

	<u>Mine production</u> ¹⁴		<u>Reserves</u> ¹⁵
	<u>2022</u>	<u>2023^e</u>	<u>(shipping grade)</u> ¹⁶
United States	—	—	630
Finland	2,000	2,000	8,300
India ^e	4,000	4,200	79,000
Kazakhstan ^e	6,000	6,000	230,000
South Africa	19,100	18,000	200,000
Turkey	5,410	6,000	27,000
Other countries	<u>5,380</u>	<u>5,200</u>	<u>NA</u>
World total (rounded)	41,900	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.

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

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

³Defined as change in total inventory from prior yearend inventory. Beginning in 2023, Government stock changes no longer available.

⁴Defined for 2019–22 as production (from mines and secondary) + imports – exports ± adjustments for Government and industry stock changes. Beginning in 2023, Government stock changes no longer included.

⁵Source: CRU Group.

⁶Excludes ferrosilicon chromium.

⁷Defined for 2019–22 as imports – exports ± adjustments for Government and industry stock changes. Beginning in 2023, Government stock changes no longer included.

⁸Includes chromium metal scrap and stainless-steel scrap.

⁹Includes chromium metal, ferrochromium, and stainless steel.

¹⁰Includes Hong Kong.

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.