

## CHROMIUM

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

**Domestic Production and Use:** In 2019, the United States was expected to consume 4% 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 firm 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 in 2018 was \$1.2 billion as measured by the value of net imports, excluding stainless steel, and was expected to be about \$810 million in 2019.

<b>Salient Statistics—United States:</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019<sup>e</sup></b>
Production:					
Mine	—	—	—	—	—
Recycling <sup>1</sup>	159	156	156	143	140
Imports for consumption	511	528	615	621	520
Exports	238	253	256	230	150
Shipments from Government stockpile	9	5	8	4	3
Consumption:					
Reported (includes recycling)	486	475	483	464	460
Apparent (includes recycling) <sup>2</sup>	441	436	523	538	510
Unit value, average annual import (dollars per ton):					
Chromite ore (gross weight)	216	198	259	279	270
Ferrochromium (chromium content) <sup>3</sup>	2,606	2,227	3,212	2,933	2,200
Chromium metal (gross weight)	11,386	9,827	9,682	11,344	11,000
Stocks, yearend, held by U.S. consumers	8	8	8	8	8
Net import reliance <sup>4</sup> as a percentage of apparent consumption	64	64	70	73	72

**Recycling:** In 2019, recycled chromium (contained in reported stainless steel scrap receipts) accounted for 28% of apparent consumption.

**Import Sources (2015–18):** Chromite (mineral): South Africa, 99%; and Canada, 1%. Chromium-containing scrap:<sup>5</sup> Canada, 49%; Mexico, 43%; and other, 8%. Chromium (primary metal):<sup>6</sup> South Africa, 34%; Kazakhstan, 9%; Russia, 8%; and other, 49%. Total imports: South Africa, 38%; Kazakhstan, 7%; Russia, 6%; and other, 49%.

<b>Tariff:<sup>7</sup> Item</b>	<b>Number</b>	<b>Normal Trade Relations 12–31–19</b>
Chromium ores and concentrates:		
Cr <sub>2</sub> O <sub>3</sub> not more than 40%	2610.00.0020	Free.
Cr <sub>2</sub> O <sub>3</sub> more than 40% and less than 46%	2610.00.0040	Free.
Cr <sub>2</sub> O <sub>3</sub> more than or equal to 46%	2610.00.0060	Free.
Chromium oxides and hydroxides:		
Chromium trioxide	2819.10.0000	3.7% ad val.
Other	2819.90.0000	3.7% ad val.
Sodium dichromate	2841.30.0000	2.4% ad val.
Potassium dichromate	2841.50.1000	1.5% ad val.
Other chromates and dichromates	2841.50.9100	3.1% ad val.
Carbides of chromium	2849.90.2000	4.2% ad val.
Ferrochromium:		
Carbon more than 4%	7202.41.0000	1.9% ad val.
Carbon more than 3%	7202.49.1000	1.9% ad val.
Carbon more than 0.5%	7202.49.5010	3.1% ad val.
Other	7202.49.5090	3.1% ad val.
Ferrosilicon chromium	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:** 22% (Domestic), 14% (Foreign).

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### Government Stockpile:<sup>8</sup>

Material <sup>9</sup>	Inventory As of 9–30–19	FY 2019		FY 2020	
		Potential Acquisitions	Potential Disposals	Potential Acquisitions	Potential Disposals
Ferrochromium:					
High-carbon	39.6	—	<sup>10</sup> 21.3	—	<sup>10</sup> 21.3
Low-carbon	27.4	—	—	—	—
Chromium metal	3.85	—	0.181	—	0.181

**Events, Trends, and Issues:** Chromium is consumed in the form of ferrochromium to produce stainless steel. South Africa was the leading chromite ore producer. Increased labor costs, increased costs for electricity, an unreliable supply of electricity, and challenges related to deep level mining, together with the decreasing cost of chromite ore, could affect production in South Africa.

China was the leading chromium-consuming country. China was also the leading stainless-steel- and ferrochromium-producing country. South Africa was the second-leading country in ferrochromium production. Ferrochromium production is electrical-energy intensive, so constrained electrical power supply and rising costs for electricity in South Africa could also impact ferrochromium production.

From September 2018 to September 2019, high-carbon ferrochromium prices decreased by 43%. Prices in September 2019 were below the prior low in October 2016.

### World Mine Production and Reserves:

	Mine production <sup>11</sup>		Reserves <sup>12</sup> (shipping grade) <sup>13</sup>
	2018	2019 <sup>e</sup>	
United States	—	—	620
Finland	2,210	2,200	13,000
India	4,300	4,100	100,000
Kazakhstan	6,690	6,700	230,000
South Africa	17,600	17,000	200,000
Turkey	8,000	10,000	26,000
Other countries	4,250	4,000	NA
World total (rounded)	43,100	44,000	570,000

**World Resources:** World resources are greater than 12 billion tons of shipping-grade chromite, sufficient to meet conceivable demand for centuries. The world's 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.

<sup>e</sup>Estimated. NA Not available. — Zero.

<sup>1</sup>Recycling production is based on reported receipts of all types of stainless steel scrap.

<sup>2</sup>Defined as production (from mines and recycling) + imports – exports + adjustments for Government and industry stock changes.

<sup>3</sup>Excludes ferrochromium silicon.

<sup>4</sup>Defined as imports – exports + adjustments for Government and industry stock changes.

<sup>5</sup>Includes chromium metal scrap and stainless steel scrap.

<sup>6</sup>Includes chromium metal, ferrochromium, and stainless steel.

<sup>7</sup>In 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.

<sup>8</sup>See Appendix B for definitions.

<sup>9</sup>Units are thousand tons of material by gross weight.

<sup>10</sup>High-carbon and low-carbon ferrochromium, combined.

<sup>11</sup>Mine production units are thousand tons, gross weight, of marketable chromite ore.

<sup>12</sup>See Appendix C for resource and reserve definitions and information concerning data sources.

<sup>13</sup>Reserves units are thousand tons of shipping-grade chromite ore, which is deposit quantity and grade normalized to 45% Cr<sub>2</sub>O<sub>3</sub>, except for the United States where grade is normalized to 7% Cr<sub>2</sub>O<sub>3</sub> and Finland where grade is normalized to 26% Cr<sub>2</sub>O<sub>3</sub>.