

TITANIUM AND TITANIUM DIOXIDE¹

(Data in metric tons unless otherwise specified)

Domestic Production and Use: Titanium sponge metal was produced by one operation in Utah. Production data were withheld to avoid disclosing company proprietary data. The facility in Salt Lake City, UT, with an estimated capacity of 500 tons per year, produced titanium that was further refined for use in electronics. A second sponge facility in Henderson, NV, with an estimated capacity of 12,600 tons per year, was idled since 2020 owing to market conditions. A third facility, in Rowley, UT, with an estimated capacity of 10,900 tons per year, has remained idle since 2016.

Although detailed 2024 consumption data were withheld to avoid disclosing proprietary data, the majority of titanium metal was used in aerospace applications, and the remainder was used in armor, chemical processing, marine hardware, medical implants, power generation, and other applications. The customs value of imported sponge was about \$450 million, a 7% increase compared with \$420 million in 2023.

In 2024, titanium dioxide (TiO₂) pigment production, by four companies operating five facilities in four States, was valued at an estimated \$3 billion. The leading uses of TiO₂ pigment were, in descending order, paints (including lacquers and varnishes), plastics, and paper. Other uses of TiO₂ pigment included catalysts, ceramics, coated fabrics and textiles, floor coverings, printing ink, and roofing granules.

Salient Statistics—United States:	2020	2021	2022	2023	2024^e
Titanium sponge metal:					
Production	W	W	W	W	W
Imports for consumption ^e	19,200	16,000	30,900	40,400	40,000
Exports	711	117	105	247	90
Consumption, apparent ²	W	³ 15,900	³ 30,800	³ 42,000	³ 40,000
Consumption, reported	W	W	W	W	W
Price, dollars per kilogram ⁴	10.60	11.10	11.10	12.40	13
Stocks, industry, yearend ^e	W	W	W	W	W
Employment, number ^e	150	20	20	20	20
Net import reliance ⁵ as a percentage of apparent consumption	>50	>95	>95	>95	>95
TiO ₂ pigment:					
Production	1,000,000	1,150,000	1,150,000	920,000	850,000
Imports for consumption	262,000	251,000	265,000	228,000	250,000
Exports	386,000	494,000	378,000	289,000	360,000
Consumption, apparent ²	880,000	906,000	1,040,000	859,000	740,000
Price, dollars per metric ton ⁴	2,710	2,920	3,450	3,240	3,200
Employment, number ^e	3,100	3,200	3,200	3,200	3,000
Net import reliance ⁵ as a percentage of apparent consumption	E	E	E	E	E

Recycling: Owing to limited responses from voluntary surveys, consumption data for titanium scrap metal for the titanium metal industry were withheld. Consumption data for titanium scrap for the steel, superalloy, and other industries were not available.

Import Sources (2020–23): Sponge metal: Japan, 82%; Kazakhstan, 9%; Saudi Arabia, 7%; and other, 2%.
TiO₂ pigment: Canada, 44%; China, 12%; Germany, 8%; Mexico, 7%; and other, 29%.

Tariff:	Item	Number	Normal Trade Relations 12–31–24
	Titanium oxides (unfinished TiO ₂ pigments)	2823.00.0000	5.5% ad valorem.
	TiO ₂ pigments, 80% or more TiO ₂	3206.11.0000	6% ad valorem.
	TiO ₂ pigments, other	3206.19.0000	6% ad valorem.
	Ferrotitanium and ferrosilicon titanium	7202.91.0000	3.7% ad valorem.
	Unwrought titanium metal	8108.20.0000	15% ad valorem.
	Titanium waste and scrap metal	8108.30.0000	Free.
	Other titanium metal articles	8108.90.3000	5.5% ad valorem.
	Wrought titanium metal	8108.90.6000	15% ad valorem.

Depletion Allowance: Not applicable.

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Government Stockpile:⁶

<u>Material</u>	<u>FY 2024</u>		<u>FY 2025</u>	
	<u>Potential acquisitions</u>	<u>Potential disposals</u>	<u>Potential acquisitions</u>	<u>Potential disposals</u>
Titanium	15,000	—	15,000	—
Titanium alloys	—	454	—	136

Events, Trends, and Issues: U.S. producers of titanium ingot and downstream products were reliant on imports of titanium sponge and scrap. U.S. imports of titanium sponge were an estimated 40,000 tons in 2024, near the historical high of 40,400 tons imported in 2023. Japan (67%), Saudi Arabia (23%), and Kazakhstan (7%) were the leading import sources for titanium sponge in 2024 through September.

With funding support from the U.S. Government, a company in Virginia was applying new technology to recycle scrap titanium metal to produce titanium powder. The company's immediate plans were to increase capacity from 2 tons per year to 125 tons per year and a long-term goal of reaching 10,000 tons per year by 2030.

U.S. imports of titanium scrap were estimated to be 28,000 tons in 2024. The United Kingdom (17%), Germany (12%), France and Japan (11% each), and Canada and the Republic of Korea (9% each) were the leading import sources for titanium waste and scrap in 2024 through September. In 2024, the annual average duty-paid unit value of scrap imports was about \$8.70 per kilogram compared with \$9.20 per kilogram in 2023.

Domestic production of TiO₂ pigment in 2024 was an estimated 850,000 tons. Although heavily reliant on imports of titanium mineral concentrates, the United States was a net exporter of TiO₂ pigments.

World Sponge Metal Production and Sponge and Pigment Capacity:

	<u>Sponge production^e</u>		<u>Capacity, 2024^{e, 7}</u>	
	<u>2023</u>	<u>2024</u>	<u>Sponge</u>	<u>Pigment</u>
United States	W	W	500	1,360,000
Australia	—	—	—	260,000
Canada	—	—	—	108,000
China	220,000	220,000	260,000	5,500,000
Germany	—	—	—	339,000
India	300	300	500	91,000
Japan	57,000	55,000	65,200	322,000
Kazakhstan	14,000	14,000	26,000	—
Mexico	—	—	—	350,000
Russia	20,000	20,000	46,500	55,000
Saudi Arabia	11,000	15,000	15,600	200,000
Ukraine	—	—	—	122,000
United Kingdom	—	—	—	315,000
Other countries	—	—	—	820,000
World total (rounded)	⁸ 320,000	⁸ 320,000	410,000	9,800,000

World Resources:⁹ Resources of titanium minerals are discussed in the Titanium Mineral Concentrates chapter.

Substitutes: Few materials possess titanium metal's strength-to-weight ratio and corrosion resistance. In high-strength applications, titanium competes with aluminum, composites, intermetallics, steel, and superalloys. Aluminum, nickel, specialty steels, and zirconium alloys may be substituted for titanium for applications that require corrosion resistance. Ground calcium carbonate, precipitated calcium carbonate, kaolin, and talc compete with TiO₂ as a white pigment.

^eEstimated. E Net exporter. W Withheld to avoid disclosing company proprietary data. — Zero.

¹See also the Titanium Mineral Concentrates chapter.

²Defined as production + imports – exports.

³Excludes domestic production of sponge in Utah.

⁴Landed duty-paid value based on U.S. imports for consumption.

⁵Defined as imports – exports.

⁶See Appendix B for definitions.

⁷Yearend operating capacity.

⁸Excludes U.S. production.

⁹See Appendix C for resource and reserve definitions and information concerning data sources.