

TITANIUM MINERAL CONCENTRATES¹

[Data in thousand metric tons, titanium dioxide (TiO₂) content, unless otherwise specified]

Domestic Production and Use: In 2024, one company recovered ilmenite and rutile concentrates from its surface-mining operations near Nahunta, GA, and Starke, FL. A second company processed existing mine tailings to recover a mixed heavy-mineral concentrate in California. A third company was in the process of commissioning a mine in Stony Creek, VA, that would produce ilmenite. Abrasive sands, monazite, and zircon were coproducts of domestic titanium minerals mining operations. Based on trade data through September, the estimated value of titanium mineral and synthetic concentrates imported into the United States in 2024 was \$600 million. More than 95% of titanium mineral concentrates were consumed by domestic TiO₂ pigment producers. The remainder was used in welding-rod coatings and for manufacturing carbides, chemicals, and titanium metal.

Salient Statistics—United States:	2020	2021	2022	2023	2024^e
Production ²	100	100	200	100	100
Imports for consumption	807	969	952	638	600
Exports, all forms ^e	18	30	110	40	5
Consumption, apparent ^{2, 3}	900	1,000	1,000	700	700
Price, dollars per metric ton:					
Rutile, bulk, minimum 95% TiO ₂ , free on board (f.o.b.) Australia ⁴	1,170	1,300	1,470	1,460	1,310
Ilmenite and leucoxene, bulk, f.o.b. Australia ⁵	459	595	530	389	500
Ilmenite, average unit value of imports ⁶	215	240	285	365	340
Slag, 80%–95% TiO ₂ , average unit value of imports ⁶	757	774	867	1,050	990
Employment, mine and mill, number	315	290	390	405	350
Net import reliance ⁷ as a percentage of apparent consumption	89	90	81	86	86

Recycling: None.

Import Sources (2020–23): South Africa, 32%; Madagascar, 16%; Canada, 13%; Australia, 11%; and other, 28%.

Tariff:	Item	Number	Normal Trade Relations 12–31–24
	Synthetic rutile	2614.00.3000	Free.
	Ilmenite and ilmenite sand	2614.00.6020	Free.
	Rutile concentrate	2614.00.6040	Free.
	Titanium slag	2620.99.5000	Free.

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

Government Stockpile: None.

Events, Trends, and Issues: Consumption of titanium mineral concentrates is closely tied to production of TiO₂ pigments that are primarily used in paint, paper, and plastics. Demand for these primary uses is related to changes in the gross domestic product. Although inventory changes were not included in the apparent consumption calculation, domestic apparent consumption of titanium mineral concentrates in 2024 was estimated to have remained level with that in 2023. Exports of titanium mineral concentrates decreased and included mixed concentrates derived from mine tailings.

As of September 2024, United States imports of titanium slag were predominantly from Canada (46%), Norway (31%), and South Africa (23%). Mozambique (38%), Madagascar (36%), and Senegal (22%) were leading sources of ilmenite, and South Africa (53%), Australia (29%), Kenya (8%), and Ukraine (8%) were the leading sources of rutile. All imports of synthetic rutile were from China.

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In 2024, China continued to be the leading producer and consumer of titanium mineral concentrates, accounting for approximately one-third of global production of ilmenite. Mozambique and South Africa also were major producers of titanium mineral concentrates. China's imports of titanium mineral concentrates for the year through October were 4.0 million tons in gross weight, a 14% increase compared with those in the same period in 2023. Mozambique (44%), Australia (12%), and Norway (9%) were the leading sources of titanium mineral concentrates to China.

World Mine Production and Reserves: Reserves for Canada, China, India, Kenya, Madagascar, Mozambique, and "Other countries" were revised based on company and Government reports.

	Mine production ^e		Reserves ⁸
	2023	2024	
Ilmenite:			
United States ^{2, 9}	100	100	2,000
Australia	400	400	¹⁰ 180,000
Canada ¹¹	350	350	51,000
China	3,250	3,300	110,000
India	210	210	15,000
Madagascar ¹¹	300	240	30,000
Mozambique	1,860	1,900	NA
Norway	360	360	37,000
Senegal	260	300	NA
South Africa ¹¹	1,260	1,300	28,000
Ukraine	130	120	5,900
Other countries	360	330	>54,000
World total (ilmenite, rounded) ⁹	8,840	8,900	>510,000
Rutile:			
United States	(⁹)	(⁹)	(⁹)
Australia	200	200	¹⁰ 35,000
India	12	12	670
Kenya	47	40	NA
Mozambique	8	8	720
Sierra Leone	110	60	2,900
South Africa	100	100	6,100
Ukraine	95	10	NA
Other countries	20	20	>540
World total (rutile, rounded) ⁹	590	450	>46,000
World total (ilmenite and rutile, rounded)	9,430	9,400	>560,000

World Resources:⁸ Ilmenite accounts for about 90% of the world's consumption of titanium minerals. World resources of anatase, ilmenite, and rutile total more than 2 billion tons.

Substitutes: Ilmenite, leucosene, rutile, slag, and synthetic rutile compete as feedstock sources for producing TiO₂ pigment, titanium metal, and welding-rod coatings.

^eEstimated. NA Not available.

¹See also the Titanium and Titanium Dioxide chapter.

²Rounded to the nearest 100,000 tons to avoid disclosing company proprietary data.

³Defined as production + imports – exports.

⁴Source: Fastmarkets IM; annual average.

⁵Source: Zen Innovations AG, Global Trade Tracker.

⁶Landed duty-paid unit value based on U.S. imports for consumption. Source: U.S. Census Bureau.

⁷Defined as imports – exports.

⁸See Appendix C for resource and reserve definitions and information concerning data sources.

⁹United States rutile production and reserves data are included with ilmenite.

¹⁰For Australia, Joint Ore Reserves Committee-compliant or equivalent reserves were estimated to be 43 million tons for ilmenite and 11 million tons for rutile, respectively, TiO₂ content.

¹¹Mine production of titaniferous magnetite is primarily used to produce titaniferous slag.