

TITANIUM MINERAL CONCENTRATES¹

(Data in thousand metric tons of TiO₂ content unless otherwise noted)

Domestic Production and Use: In 2018, two companies recovered ilmenite and rutile concentrates from surface-mining operations near Nahunta, GA, and Starke, FL, and a third company processed existing mineral sands tailings in Florida. Based on reported data through August 2018, the estimated value of titanium mineral concentrates imported in the United States in 2018 was \$654 million. Zircon was a coproduct of mining from ilmenite and rutile deposits. About 90% of titanium mineral concentrates were consumed by domestic titanium dioxide (TiO₂) pigment producers. The remaining 10% was used in welding-rod coatings and for manufacturing carbides, chemicals, and metal.

Salient Statistics—United States:	2014	2015	2016	2017	2018^e
Production ²	100	200	100	100	100
Imports for consumption	1,110	1,100	1,020	1,180	1,100
Exports, all forms ^e	1	2	5	6	30
Consumption, apparent ³	1,210	1,300	1,120	1,270	1,100
Price, dollars per metric ton:					
Rutile, bulk, minimum 95% TiO ₂ , f.o.b. Australia ⁴	950	840	740	740	990
Ilmenite, bulk, minimum 54% TiO ₂ , f.o.b. Australia ⁴	155	110	105	173	NA
Ilmenite, import, dollars per ton	172	215	142	172	220
Slag, 80%–95% TiO ₂ ⁵	679–761	687–742	612–682	621–700	690–720
Employment, mine and mill, number	234	285	156	264	270
Net import reliance ⁶ as a percentage of apparent consumption	92	85	91	92	91

Recycling: None.

Import Sources (2014–17): South Africa, 35%; Australia, 27%; Canada, 12%; Mozambique, 11%; and other, 15%.

Tariff: Item	Number	Normal Trade Relations
		12–31–18
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 tied to production of TiO₂ pigments that are primarily used in paint, paper, and plastics. Domestic apparent consumption of titanium mineral concentrates in 2018 was estimated to have decreased by about 13 percent from that of 2017. Although exports were estimated to have increased fivefold in 2018, they were a result of an intracompany transfer that moved 27,000 tons of stockpiled ilmenite from its former operations in Virginia to its synthetic rutile kiln in Western Australia in February. Prices for ilmenite, rutile, and titanium slag all increased through 2018.

A company was conducting a feasibility study of the Dundas ilmenite project on the northwest coast of Greenland. Large-scale production was expected to begin in 2019 contingent upon obtaining customer offtake agreements. A major producer of titanium minerals was restarting its Jacinth-Ambrosia Mine in South Australia and was further developing its operations in Sierra Leone in order to increase its production of natural rutile. Other projects were being developed in Australia, Mozambique, and Tanzania.

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World Mine Production and Reserves: Reserves for China were revised based on data from the National Bureau of Statistics of China.

	Mine production		Reserves ⁷
	<u>2017</u>	<u>2018^e</u>	
Ilmenite:			
United States ²	⁸ 100	⁸ 100	⁸ 2,000
Australia	730	700	⁹ 250,000
Brazil	50	50	43,000
Canada ¹⁰	880	850	31,000
China	840	850	230,000
India	300	300	85,000
Kenya	280	280	54,000
Madagascar	110	100	40,000
Mozambique	600	600	14,000
Norway	220	200	37,000
Senegal	300	250	NA
South Africa ¹⁰	550	500	63,000
Ukraine	230	230	5,900
Vietnam	200	200	1,600
Other countries	<u>150</u>	<u>150</u>	<u>26,000</u>
World total (ilmenite, rounded)	⁸ 5,540	⁸ 5,400	⁸ 880,000
Rutile:			
United States	(8)	(8)	(8)
Australia	290	250	⁹ 29,000
India	10	10	7,400
Kenya	87	90	13,000
Mozambique	9	8	880
Senegal	10	8	NA
Sierra Leone	160	170	490
South Africa	95	100	8,300
Ukraine	95	100	2,500
Other countries	<u>13</u>	<u>10</u>	<u>400</u>
World total (rutile, rounded)	⁸ 770	⁸ 750	⁸ 62,000
World total (ilmenite and rutile, rounded)	6,300	6,100	940,000

World Resources: Ilmenite accounts for about 89% of the world's consumption of titanium minerals. World resources of anatase, ilmenite, and rutile total more than 2 billion tons.

Substitutes: Ilmenite, leucoxene, 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 Titanium and Titanium Dioxide.

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

³Defined as production + imports – exports.

⁴Source: Industrial Minerals; average of yearend price. Prices of ilmenite from Australia were discontinued at yearend 2017.

⁵Landed duty-paid value based on U.S. imports for consumption. Data series revised to reflect annual average unit value range of significant importing countries.

⁶Defined as imports – exports.

⁷See Appendix C for resource and reserve definitions and information concerning data sources.

⁸U.S. rutile production and reserves data are included with ilmenite.

⁹For Australia, Joint Ore Reserves Committee-compliant reserves for ilmenite and rutile were about 57 million and 7 million tons, respectively.

¹⁰Mine production is primarily used to produce titaniferous slag.