TITANIUM MINERAL CONCENTRATES[1]

(Data in thousand metric tons of TiO_2 content unless otherwise noted)

Domestic Production and Use: In 2020, one company was recovering ilmenite and rutile concentrates from its surface-mining operations near Nahunta, GA, and Starke, FL. A second company processed existing mineral sands mine tailings in Florida and South Carolina. Based on reported data through October 2020, the estimated value of titanium mineral and synthetic concentrates imported into the United States was $520 million. Abrasive sands, monazite, and zircon were coproducts of domestic mining operations. About 90% of titanium mineral concentrates were consumed by domestic titanium dioxide (TiO_2) pigment producers. The remaining 10% was used in welding-rod coatings and for manufacturing carbides, chemicals, and titanium metal.

Salient Statistics—United States:	**2016**	**2017**	**2018**	**2019[e]**	**2020[e]**
Production[2]	100	100	100	100	100
Imports for consumption	1,020	1,170	1,100	1,160	780
Exports, all forms[e]	5	6	32	8	19
Consumption, apparent[3]	1,100	1,300	1,200	1,300	900
Price, dollars per metric ton:					
Rutile, bulk, minimum 95% TiO_2, f.o.b. Australia[4]	740	740	1,025	1,125	1,200
Ilmenite, bulk, minimum 54% TiO_2, f.o.b. Australia[4]	105	173	NA	NA	NA
Ilmenite, import	142	172	219	186	210
Slag, 80%–95% TiO_2[5]	612–682	621–700	699–738	742–897	640–1,020
Employment, mine and mill, number	155	286	299	310	260
Net import reliance[6] as a percentage of apparent consumption	91	92	91	92	88

Recycling: None.

Import Sources (2016–19): South Africa, 39%; Australia, 20%; Madagascar, 10%; Mozambique, 9%; and other, 22%.

Tariff: Item	**Number**	**Normal Trade Relations 12–31–20**
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) and 14% (foreign).

Government Stockpile: None.

Events, Trends, and Issues: Consumption of titanium mineral concentrates is tied to production of TiO_2 pigments that are primarily used in paint, paper, and plastics. Demand for these primary uses are tied to changes in the gross domestic product. Demand in the first half of 2020 decreased sharply owing to restrictions implemented to limit the spread of the COVID-19 virus. In the second half of 2020, titanium producers reported that demand was recovering, led by demand for TiO_2 in paints and coatings. Domestic apparent consumption of titanium mineral concentrates in 2020 was estimated to have decreased by about 30% from that of 2019; however, inventory changes were not included in this calculation. Although small compared with apparent consumption, exports of titanium mineral concentrates increased substantially from those in the previous year owing to increased exports to China, India, and the Netherlands.

Australia, China, and South Africa were the leading producers of titanium mineral concentrates. China continued to be both the leading producer and consumer of titanium mineral concentrates. In 2020, China's imports of titanium mineral concentrates were about 3 million tons in gross weight, an increase of 19% compared with those in 2019. In Guangdong Province, capacity to produce up to 200,000 tons per year of synthetic rutile was being commissioned. As of October, Mozambique (36%), Australia (14%), Vietnam (11%), and Kenya (11%) were the leading sources of titanium mineral concentrates to China. In Saudi Arabia, owing to technical problems and COVID-19 pandemic concerns, commissioning of a project to produce up to 500,000 tons per year of titanium slag was delayed until 2021. Other projects were being developed in Australia, China, Malawi, Mozambique, Norway, Senegal, and Tanzania.

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TITANIUM MINERAL CONCENTRATES

World Mine Production and Reserves: Reserves for Australia, Kenya, Madagascar, Mozambique, and South Africa were revised based on Government or industry reports.

	Mine production		Reserves[7]
	2019	2020[e]	
Ilmenite:			
United States[2, 8]	100	100	2,000
Australia	840	800	[9]150,000
Brazil	25	25	43,000
Canada[10]	680	680	31,000
China	2,300	2,300	230,000
India	162	160	85,000
Kenya	210	190	440
Madagascar[10]	280	300	23,000
Mozambique	590	600	26,000
Norway	400	400	37,000
Senegal	310	310	NA
South Africa[10]	1,100	1,000	35,000
Ukraine	490	470	5,900
Vietnam	160	160	1,600
Other countries	74	70	26,000
World total (ilmenite, rounded)[8]	7,700	7,600	700,000
Rutile:			
United States	([8])	([8])	([8])
Australia	200	200	[9]27,000
India	11	11	7,400
Kenya	74	74	170
Mozambique	6	6	890
Senegal	9	9	NA
Sierra Leone	129	120	490
South Africa	110	100	6,800
Ukraine	94	94	2,500
Other countries	21	20	400
World total (rutile, rounded)[8]	654	630	46,000
World total (ilmenite and rutile, rounded)	8,400	8,200	740,000

World Resources:[7] 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, leucoxene, rutile, slag, and synthetic rutile compete as feedstock sources for producing TiO_2 pigment, titanium metal, and welding-rod coatings.

[e]Estimated. NA Not available.

[1]See also Titanium and Titanium Dioxide.

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

[3]Defined as production + imports – exports. Rounded to the nearest 100,000 tons to avoid disclosing company proprietary data.

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

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

[6]Defined as imports – exports.

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

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

[9]For Australia, Joint Ore Reserves Committee-compliant reserves for ilmenite and rutile were estimated to be 36 million and 8.2 million tons, respectively.

[10]Mine production is primarily used to produce titaniferous slag.