

TITANIUM MINERAL CONCENTRATES¹

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

Domestic Production and Use: Two firms produced ilmenite and rutile concentrates from surface-mining operations in Florida and Virginia. The value of titanium mineral concentrates consumed in the United States in 2011 was about \$650 million. Zircon was a coproduct of mining from ilmenite and rutile deposits. About 95% of titanium mineral concentrates was consumed by domestic titanium dioxide (TiO₂) pigment producers. The remaining 5% was used in welding rod coatings and for manufacturing carbides, chemicals, and metal.

Salient Statistics—United States:	2007	2008	2009	2010	2011^e
Production ² (rounded)	300	200	200	200	300
Imports for consumption	1,220	1,110	927	958	1,100
Exports, ^e all forms	6	7	9	12	20
Consumption, estimated	1,600	1,440	1,360	1,460	1,580
Price, dollars per metric ton, yearend:					
Ilmenite, bulk, minimum 54% TiO ₂ , f.o.b. Australia	80	111	73	75	200
Rutile, bulk, minimum 95% TiO ₂ , f.o.b. Australia	488	525	533	540	1,400
Slag, 80%–95% TiO ₂ ³	418–457	393–407	401–439	367–433	550–650
Stocks, mine, consumer, yearend	NA	NA	NA	NA	NA
Employment, mine and mill, number ^e	225	144	194	178	195
Net import reliance ⁴ as a percentage of estimated consumption	76	78	68	65	68

Recycling: None.

Import Sources (2007–10): South Africa, 44%; Australia, 30%; Canada, 14%; Mozambique, 6%; and other, 6%.

Tariff:	Item	Number	Normal Trade Relations
			12-31-11
	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 consumption of TiO₂ pigments primarily used in paint, paper, and plastics. Owing to increased production of TiO₂ pigment, domestic consumption of titanium mineral concentrates was estimated to have increased by 8% in 2011 compared with that in 2010. Increased global consumption of titanium minerals was led by China.

Although world mine production increased in 2011, a shortage of titanium mineral concentrates caused prices for titanium mineral concentrates to rise significantly. Rising costs for titanium minerals has encouraged vertical integration within the mineral and pigment industries.

In Mozambique, plans were underway to expand mine production capacity at the Moma mining operation to 1.2 million tons per year of ilmenite and 14,000 tons per year of rutile, a 50% increase compared with the existing design capacity. In Saudi Arabia, plans were underway to construct a titanium slag plant with a production capacity of 500,000 tons per year. South African production of slag in 2011 was mitigated by a burn through at a slag operation. In Richards Bay, KwaZulu-Natal, South Africa, a tailings treatment plant was commissioned. Heavy-mineral concentrates, including ilmenite and rutile, were to be recovered from about 30 years of accumulated mine tailings. In Mtunzini, the Fairbreeze deposit was once again under development, with 500,000 tons per year of ilmenite and 25,000 tons per year of rutile production capacity scheduled for startup in 2013. In the Ukraine, the Birzulivske Mine was being commissioned with a production capacity of 185,000 tons per year; mine production capacity may rise to 300,000 tons per year in 2012. In Vietnam, Government policies were being developed to stop ilmenite exports, control illegal mining, and promote the development of upgraded products. Although a ban on exports was approved in 2008, it has been repeatedly delayed to help mining companies that have been hurt by global economic conditions. The export ban was once again delayed until yearend 2011.

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World Mine Production and Reserves:

	Mine production		Reserves ⁵
	<u>2010</u>	<u>2011^e</u>	
Ilmenite:			
United States ²	⁶ 200	⁶ 300	2,000
Australia	991	900	100,000
Brazil	45	45	43,000
Canada ⁷	754	700	31,000
China	550	500	200,000
India	540	550	85,000
Madagascar	172	280	40,000
Mozambique	407	510	16,000
Norway ⁷	300	300	37,000
South Africa ⁷	952	1,030	63,000
Sri Lanka	32	60	NA
Ukraine	300	300	5,900
Vietnam	485	490	1,600
Other countries	37	37	26,000
World total (ilmenite, rounded)	<u>5,800</u>	<u>6,000</u>	<u>650,000</u>
Rutile:			
United States	(⁸)	(⁸)	(⁸)
Australia	361	400	18,000
Brazil	3	3	1,200
India	24	24	7,400
Madagascar	5	8	NA
Malaysia	7	8	NA
Mozambique	4	6	480
Sierra Leone	65	60	3,800
South Africa	145	131	8,300
Sri Lanka	2	2	NA
Ukraine	57	57	2,500
Other countries	—	—	400
World total (rutile, rounded)	<u>⁸670</u>	<u>⁸700</u>	<u>42,000</u>
World total (ilmenite and rutile, rounded)	6,400	6,700	690,000

World Resources: 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 TiO₂ pigment, titanium metal, and welding-rod coatings.

^eEstimated. NA Not available. — Zero.

¹See also Titanium and Titanium Dioxide.

²Rounded to one significant digit to avoid disclosing company proprietary data.

³Landed duty-paid value based on U.S. imports for consumption.

⁴Defined as imports – exports + adjustments for Government and industry stock changes.

⁵[See Appendix C for resource/reserve definitions and information concerning data sources.](#)

⁶Includes rutile.

⁷Mine production is primarily used to produce titaniferous slag.

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