

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 2003 was about \$500 million. The major coproduct of mining from ilmenite and rutile deposits was zircon. About 97% of titanium mineral concentrates was consumed by domestic TiO₂ pigment producers. The remainder was used in welding rod coatings and for manufacturing carbides, chemicals, and metal.

Salient Statistics—United States:	1999	2000	2001	2002	2003^e
Production ² (ilmenite and rutile, rounded)	300	300	300	300	300
Imports for consumption:					
Ilmenite and slag	776	647	737	599	565
Rutile, natural and synthetic	324	413	303	368	419
Exports, ^e all forms	6	12	5	2	8
Consumption, reported:					
Ilmenite and slag ³	963	919	856	951	950
Rutile, natural and synthetic	413	497	448	452	450
Price, dollars per metric ton:					
Ilmenite, bulk, 54% TiO ₂ , f.o.b. Australian ports	98	94	100	93	93
Rutile, yearend, bulk, f.o.b. Australian ports	473	485	475	450	430
Slag: ^e					
80% TiO ₂ , f.o.b. Sorel, Quebec	390	362	335	340	340
85% TiO ₂ , f.o.b. Richards Bay, South Africa	406	425	419	445	408
Stocks, mine, consumer, yearend:					
Ilmenite	343	262	221	197	200
Rutile	96	101	118	75	75
Employment, mine and mill, number ^e	366	360	360	366	269
Net import reliance ⁴ as a percentage of reported consumption	75	79	78	74	70

Recycling: None.

Import Sources (1999-2002): South Africa, 43%; Australia, 32%; Canada, 14%; Ukraine, 6%; and other, 5%.

Tariff: Item	Number	Normal Trade Relations
		12/31/03
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.

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Events, Trends, and Issues: Global consumption of titanium mineral concentrates was estimated to have increased slightly in 2003 compared with that of 2002. Domestic consumption of titanium mineral concentrates was nearly unchanged. The United States relied heavily on imports primarily from Australia and South Africa.

In the United States, preparations were underway to expand dry mining in northern Florida and southern Georgia in 2004. A 1,000-ton-per-hour separation unit is expected to be operational in 2004. As part of a cost reduction program, the 200,000-ton-per-year synthetic rutile plant near Mobile, AL, was permanently idled. The plant was based on a hydrochloric leach process and was the only domestic source of synthetic rutile.

Two new titanium slag furnaces were commissioned in KwaZulu-Natal, South Africa. When fully operational, the two furnaces will produce up to 250,000 tons per year of titanium slag. Ilmenite feedstock will be supplied to the furnaces from the Hillendale mine about 10 kilometers from Richards Bay.

On a global basis, declining ore grades of active mining operations have encouraged the exploration and development for new sources of titanium minerals. Projects under development include the following: Athabasca oil sands (Alberta, Canada), Corridor Sands (Gaza, Mozambique), Douglas (Murray Basin, Australia), Kwale (Mombasa, Kenya), Moma (Nampula, Mozambique), Pooncarie (Murray Basin, Australia), Truro (Nova Scotia, Canada), and Wemen (Murray Basin, Australia).

World Mine Production, Reserves, and Reserve Base:

	Mine production		Reserves ⁵	Reserve base ⁵
	2002	2003 ^e		
Ilmenite:				
United States ²	⁶ 300	⁶ 300	6,000	59,000
Australia	1,170	1,090	⁷ 200,000	⁷ 250,000
Canada ⁸	720	720	31,000	36,000
India	248	240	30,000	38,000
Norway ⁸	338	340	40,000	40,000
South Africa ⁸	978	950	63,000	220,000
Ukraine	281	290	5,900	13,000
Other countries	<u>382</u>	<u>380</u>	<u>49,000</u>	<u>84,000</u>
World total (ilmenite, rounded)	4,400	4,300	420,000	740,000
Rutile:				
United States	(⁹)	(⁹)	400	1,800
Australia	207	220	⁷ 22,000	⁷ 34,000
India	17	16	6,600	7,700
South Africa	94	110	8,300	24,000
Ukraine	67	67	2,500	2,500
Other countries	<u>2</u>	<u>2</u>	<u>8,000</u>	<u>17,000</u>
World total (rutile, rounded)	¹⁰ 390	¹⁰ 420	48,000	87,000
World total (ilmenite and rutile, rounded)	4,800	4,700	470,000	830,000

World Resources: Ilmenite supplies about 90% of the world's demand for titanium minerals. World ilmenite resources total about 1 billion tons of titanium dioxide. Identified world resources of rutile (including anatase) total about 230 million tons of contained TiO₂.

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

^eEstimated.

¹See also Titanium and Titanium Dioxide.

²Rounded to the nearest 0.1 million ton to protect proprietary data.

³Excludes ilmenite used to produce synthetic rutile.

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

⁵See Appendix C for definitions.

⁶Includes rutile to avoid disclosing company proprietary data.

⁷Derived from data published by the Australian Geological Survey Organisation.

⁸Mine production is primarily used to produce titaniferous slag. Reserves and reserve base are ilmenite.

⁹Included with ilmenite to avoid disclosing company proprietary data.

¹⁰Excludes U.S. production.