

TITANIUM AND TITANIUM DIOXIDE¹

(Data in metric tons unless otherwise noted)

Domestic Production and Use: Titanium sponge metal was produced by three operations in Nevada and Utah. Ingot was produced by 10 operations in 8 States. Numerous firms consumed ingot to produce wrought products and castings. In 2012, an estimated 72% of the titanium metal was used in aerospace applications. The remaining 28% was used in armor, chemical processing, marine, medical, power generation, sporting goods, and other nonaerospace applications. The value of sponge metal consumed was about \$388 million, assuming an average selling price of \$11.75 per kilogram.

In 2012, titanium dioxide (TiO₂) pigment, which was valued at about \$3.9 billion, was produced by four companies at six facilities in five States. The estimated use of TiO₂ pigment by end use was paint (includes lacquers and varnishes), 59%; plastic, 28%; paper, 9%; and other, 4%. Other uses of TiO₂ included catalysts, ceramics, coated fabrics and textiles, floor coverings, printing ink, and roofing granules.

Salient Statistics—United States:	2008	2009	2010	2011	2012^e
Titanium sponge metal:					
Production	W	W	W	W	W
Imports for consumption	23,900	16,600	20,500	33,800	40,300
Exports	2,370	820	293	256	1,700
Consumption, reported	W	W	34,900	48,400	33,000
Price, dollars per kilogram, yearend	15.64	15.58	10.74	9.93	11.75
Stocks, industry yearend ^e	14,200	15,300	10,500	10,800	14,000
Employment, number ^e	350	300	300	300	300
Net import reliance ² as a percentage of reported consumption	W	W	72	69	64
Titanium dioxide:					
Production	1,350,000	1,230,000	1,320,000	1,290,000	1,300,000
Imports for consumption	183,000	175,000	204,000	200,000	216,000
Exports	733,000	649,000	758,000	789,000	674,000
Consumption, apparent	800,000	757,000	767,000	706,000	842,000
Producer price index, yearend	170	164	194	268	298
Stocks, producer, yearend	NA	NA	NA	NA	NA
Employment, number ^e	4,200	3,800	3,400	3,400	3,400
Net import reliance ² as a percentage of apparent consumption	E	E	E	E	E

Recycling: New scrap metal recycled by the titanium industry totaled about 35,000 tons in 2012. Estimated use of titanium as scrap and ferrotitanium by the steel industry was about 10,000 tons; by the superalloy industry, 1,000 tons; and in other industries, 1,000 tons. Old scrap reclaimed totaled about 1,000 tons.

Import Sources (2008–11): Sponge metal: Japan, 40%; Kazakhstan, 40%; China, 8%; Ukraine, 4%; and other, 8%. Titanium dioxide pigment: Canada, 43%; China, 14%; Germany, 6%; Finland, 6%; and other, 31%.

Tariff:	Item	Number	Normal Trade Relations
			12–31–12
	Titanium oxides (unfinished TiO ₂ pigments)	2823.00.0000	5.5% ad val.
	TiO ₂ pigments, 80% or more TiO ₂	3206.11.0000	6.0% ad val.
	TiO ₂ pigments, other	3206.19.0000	6.0% ad val.
	Ferrotitanium and ferrosilicon titanium	7202.91.0000	3.7% ad val.
	Unwrought titanium metal	8108.20.0000	15.0% ad val.
	Titanium waste and scrap metal	8108.30.0000	Free.
	Other titanium metal articles	8108.90.3000	5.5% ad val.
	Wrought titanium metal	8108.90.6000	15.0% ad val.

Depletion Allowance: Not applicable.

Government Stockpile: None.

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Events, Trends, and Issues: Owing to rising feedstock prices, depressed economic conditions in Europe and China, and the depletion of existing stocks, global consumption of TiO₂ pigment was expected to be down in 2012. Consumption and production of TiO₂ pigment was led by China, and several TiO₂ pigment producers in China suspended production on reduced market demand. Domestic production of TiO₂ pigment in 2012 was expected to remain the same as that of 2011. Apparent consumption of TiO₂ pigment in the United States was expected to increase by 19% owing to a 15% decrease in exports in 2012 compared with those of 2011.

Consumption of titanium metal in the commercial aerospace industry continued to increase. In the United States, a titanium sponge facility in Rowley, UT, completed the standard-grade qualification process necessary to produce titanium for aerospace, industrial, and medical applications. New titanium-powder production capacity of 1,800 tons per year neared completion in Ottawa, IL. Instead of sponge produced by magnesium reduction via the Kroll process, the plant produced titanium metal powder by sodium reduction by the Armstrong process. Production capacity was expected to be 2,000 tons per year by yearend 2012. A new titanium production facility was inaugurated in Martinsville, VA, to produce mill products for the commercial aerospace industry. Production capacity was expected to be 6,300 tons per year.

Japan and Kazakhstan were the leading U.S. import sources of titanium sponge in 2012. Increased imports of titanium sponge were led by Ukraine and Japan.

World Sponge Metal Production and Sponge and Pigment Capacity:

	Sponge production		Capacity 2012 ³	
	2011	2012 ^e	Sponge	Pigment
United States	W	W	24,000	1,470,000
Australia	—	—	—	281,000
Belgium	—	—	—	74,000
Canada	—	—	—	90,000
China ^e	60,000	80,000	114,000	2,000,000
Finland	—	—	—	130,000
France	—	—	—	125,000
Germany	—	—	—	440,000
Italy	—	—	—	80,000
Japan ^e	40,000	40,000	62,200	309,000
Kazakhstan ^e	20,700	20,700	26,000	1,000
Mexico	—	—	—	130,000
Russia ^e	25,800	40,000	46,500	20,000
Spain	—	—	—	80,000
Ukraine ^e	9,000	9,000	10,000	120,000
United Kingdom	—	—	—	300,000
Other countries	—	—	—	900,000
World total (rounded)	⁴ 156,000	⁴ 190,000	283,000	6,550,000

World Resources:⁵ Resources and reserves of titanium minerals are discussed in Titanium Mineral Concentrates. The commercial feedstock sources for titanium are ilmenite, leucoxene, rutile, slag, and synthetic rutile.

Substitutes: There are few materials that possess titanium metal's strength-to-weight ratio and corrosion resistance. In high-strength applications, titanium competes with aluminum, composites, intermetallics, steel, and superalloys. Aluminum, nickel, specialty steels, and zirconium alloys may be substituted for titanium for applications that require corrosion resistance. Ground calcium carbonate, precipitated calcium carbonate, kaolin, and talc compete with titanium dioxide as a white pigment.

^eEstimated. E Net exporter. NA Not available. W Withheld to avoid disclosing company proprietary data. — Zero.

¹See also Titanium Mineral Concentrates.

²Defined as imports – exports + adjustments for Government and industry stock changes.

³Yearend operating capacity.

⁴Excludes U.S. production.

⁵See Appendix C for resource/reserve definitions and information concerning data sources.