TITANIUM AND TITANIUM DIOXIDE[1]

(Data in metric tons, unless otherwise noted)

Domestic Production and Use: Titanium sponge metal was produced by two firms with operations in Nevada and Oregon. Ingot was made by the two sponge producers and by nine other firms in seven States. About 30 companies produced titanium forgings, mill products, and castings. In 1997, an estimated 65% of the titanium metal used was in aerospace applications. The remaining 35% was used in the chemical process industry, power generation, marine, ordnance, medical, and other nonaerospace applications. The value of sponge metal consumed was about $308 million, assuming an average selling price of $9.70 per kilogram ($4.40 per pound).

In 1997, titanium dioxide (TiO_2) pigment, valued at about $2.73 billion, was produced by 5 companies at 11 plants in 9 States. TiO_2 was used in paint, varnishes, and lacquers, 48%; plastics, 19%; and other, 33%. Other uses of TiO_2 included catalysts, ceramics, coated fabrics and textiles, floor coverings, paper, printing ink, and roofing granules.

Salient Statistics—United States:	1993	1994	1995	1996	1997[e]
Titanium metal:					
Production, sponge	W	W	W	W	W
Imports for consumption, sponge	2,160	6,470	7,560	10,100	15,300
Exports, all metal forms	7,890	9,660	10,800	12,100	15,200
Shipments from Government stockpile excesses	—	—	—	—	227
Consumption of sponge metal, reported	15,100	17,200	21,500	28,400	31,800
Price, sponge, dollars per pound, yearend	3.75	4.00	4.40	4.40	4.40
Stocks, sponge, industry yearend[e]	2,905	5,570	5,270	4,390	5,460
Employment, reduction plants, number[e]	350	300	300	300	300
Net import reliance,[2] sponge only, as a percent of apparent consumption	W	W	W	W	W
Titanium dioxide:					
Production	1,160,000	1,250,000	1,250,000	1,230,000	1,330,000
Imports for consumption	172,000	176,000	183,000	167,000	196,000
Exports	290,000	352,000	342,000	332,000	368,000
Consumption, apparent	1,030,000	1,090,000	1,080,000	1,070,000	1,150,000
Price, rutile, list, dollars per pound, yearend	0.94	0.93	1.01	1.09	0.93
Stocks, producer, yearend	123,000	106,000	120,000	107,000	108,000
Employment, number [e]	4,600	4,600	4,600	4,600	4,600
Net import reliance[2] as a percent of apparent consumption	E	E	E	E	E

Recycling: New scrap metal recycled by the titanium industry was about 26,500 tons in 1997. In addition, estimated use of titanium as scrap and in the form of ferrotitanium made from scrap by the steel industry was about 5,300 tons; by the superalloy industry, 750 tons; and in other industries, 1,200 tons. Old scrap reclaimed was about 200 to 400 tons. Minor amounts of TiO_2 were recycled.

Import Sources (1993-96): Sponge metal: Russia, 60%; Japan, 25%; China, 6%; Kazakstan, 4%; and other, 5%. Titanium dioxide pigment: Canada, 40%; Germany, 13%; France, 11%; the United Kingdom, 6%; Spain, 4%; and other, 26%.

Tariff: Item	Number	Most favored nation (MFN) 12/31/97	Non-MFN[3] 12/31/97
Waste and scrap metal	8108.10.1000	Free	Free.
Unwrought metal	8108.10.5000	15.0% ad val.	25.0% ad val.
Wrought metal	8108.90.6000	15.0% ad val.	45.0% ad val.
Titanium dioxide pigments	3206.10.0000	6.0% ad val.	30.0% ad val.
Titanium oxides	2823.00.0000	5.8% ad val.	30.0% ad val.

Depletion Allowance: Not applicable.

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TITANIUM AND TITANIUM DIOXIDE

Government Stockpile: In addition to the quantities shown below, the stockpile contained 9,860 tons of nonstockpile-grade sponge metal.

Stockpile Status—9-30-97[4]

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 1997	Disposals FY 1997
Titanium sponge	33,156	—	—	—	227

Events, Trends, and Issues: In 1997, domestic production of titanium pigment reached a record level and increased an estimated 10% compared with 1996. Exports of titanium pigment increased 11%. Apparent consumption of titanium pigment increased 7% and published prices of rutile-grade pigment decreased 15%. According to company press releases, the world's largest producer of titanium pigment plans to acquire nearly all of the pigment facilities of the second largest pigment producer. This would increase its share of global capacity from 23% to about 37%.

Demand for titanium metal products was at record levels in 1997. Domestic production of titanium ingot and mill products were expected to reach 58,000 tons and 33,500 tons, respectively. In response to strong demand from commercial aerospace markets, domestic producers of titanium ingot announced plans for significant capacity expansions. In midyear 1998, a 9,000-ton-per-year furnace is scheduled for start-up in Morgantown, PA , and a new 10,000-ton-per-year facility is being constructed in Richland, WA. In 1999, a 3,000-ton-per-year expansion is expected somewhere in Ohio. A new 340-ton-per-year titanium sponge facility completed its first year of operation at Salt Lake City, UT. The new facility uses the Hunter-process to produce a feedstock for electronic grade titanium metal. At yearend an agreement was reached whereby one of the two domestic producers of titanium sponge will be acquired by a major producer of ingot and mill products.

World Sponge Metal Production and Sponge and Pigment Capacity:

	Sponge production		Capacity 1997	
	1996	1997[e]	Sponge	Pigment
United States	W	W	[5]29,800	1,360,000
Australia	—	—	—	164,000
Belgium	—	—	—	80,000
Canada	—	—	—	91,000
China[e]	2,000	2,000	7,000	45,000
Finland	—	—	—	80,000
France	—	—	—	225,000
Germany	—	—	—	350,000
Italy	—	—	—	80,000
Japan	21,100	24,100	25,800	326,000
Kazakstan[e]	10,000	12,000	35,000	1,000
Russia[e]	18,000	20,000	35,000	20,000
Spain	—	—	—	65,000
Ukraine[e]	—	—	—	120,000
United Kingdom[e]	—	—	—	275,000
Other countries	—	—	—	585,000
World total (may be rounded)	[6]51,000	[6]58,000	130,000	3,900,000

World Resources: Resources of titanium minerals are discussed in the sections on ilmenite and rutile. Most titanium for domestic sponge production was obtained from rutile or rutile substitutes. The sources for pigment production were ilmenite, slag, and rutile.

Substitutes: There are few substitutes for titanium in aircraft and space use without some sacrifice of performance. For industrial uses, high-nickel steel, zirconium, and, to a limited extent, the superalloy metals may be substituted. There is no cost-effective substitute for TiO_2 pigment.

[e]Estimated. E Net exporter. W Withheld to avoid disclosing company proprietary data.

[1]See also Ilmenite and Rutile.

[2]Defined as imports - exports + adjustments for Government and industry stock changes.

[3]See Appendix B.

[4]See Appendix C for definitions.

[5]Current operating capacity is 22,600 tons per year.

[6]Excludes U.S. production.