TITANIUM AND TITANIUM DIOXIDE1

(Data in metric tons, unless otherwise noted)

<u>Domestic Production and Use</u>: 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 firms consume ingot to produce forged components, mill products, and castings. In 1998, 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 \$316 million, assuming an average selling price of \$9.70 per kilogram (\$4.40 per pound).

In 1998, titanium dioxide (TiO₂) pigment, valued at about \$3 billion, was produced by 5 companies at 11 plants in 9 States. TiO₂ was used in paint, varnishes, and lacquers, 50%; paper, 23%; plastics, 18%; and other, 9%. Other uses of TiO₂ included catalysts, ceramics, coated fabrics and textiles, floor coverings, printing ink, and roofing granules.

Salient Statistics—United States:	<u> 1994</u>	<u> 1995</u>	<u>1996</u>	<u> 1997</u>	<u>1998°</u>
Titanium sponge metal:					
Production	W	W	W	W	W
Imports for consumption	6,470	7,560	10,100	16,100	13,200
Exports ²	126	225	528	976	387
Shipments from Government stockpile					
excesses	_	_	_	227	1,140
Consumption, reported	17,200	21,500	28,400	32,000	32,600
Price, dollars per pound, yearend	4.00	4.40	4.40	4.40	4.40
Stocks, industry yearend ^e	5,570	5,270	4,390	5,470	10,400
Employment, number ^e	300	300	300	300	300
Net import reliance, ³ as a percent of					
reported consumption	21	36	37	47	28
Titanium dioxide:					
Production	1,250,000	1,250,000	1,230,000	1,340,000	1,360,000
Imports for consumption	176,000	183,000	167,000	194,000	198,000
Exports	352,000	342,000	332,000	405,000	430,000
Consumption, apparent	1,090,000	1,080,000	1,070,000	1,130,000	1,130,000
Price, rutile, list, dollars per pound, yearend	0.93	1.01	1.09	0.93	1.00
Stocks, producer, yearend	106,000	120,000	107,000	108,000	106,000
Employment, number ^e	4,600	4,600	4,600	4,600	4,600
Net import reliance ³ as a percent of					
apparent consumption	E	Е	E	Е	Е

Recycling: New scrap metal recycled by the titanium industry was about 31,400 tons in 1998. In addition, estimated use of titanium as scrap and in the form of ferrotitanium made from scrap by the steel industry was about 4,700 tons; by the superalloy industry, 800 tons; and in other industries, 1,000 tons. Old scrap reclaimed was about 300 tons. Minor amounts of TiO_2 were recycled.

Import Sources (1994-97): Sponge metal: Russia, 55%; Japan, 32%; Kazakhstan, 5%; China, 4%; and other, 4%. Titanium dioxide pigment: Canada, 43%; Germany, 14%; France, 11%; Spain, 5%; and other, 27%.

<u>Tariff</u> : Item	Number	Normal Trade Relations (NTR) 12/31/98	Non-NTR⁴ <u>12/31/98</u>
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	5.6% ad val.	30.0% ad val.

Depletion Allowance: Not applicable.

Government Stockpile:

Stockpile Status—9-30-98°					
Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 1998	Disposals FY 1998
	iliv e litory	iliv e litory	ioi uisposai	1 1 1990	1 1 1990
Titanium sponge	31.700	837	31.700	3.630	1.140

Prepared by Joseph M. Gambogi [(703) 648-7718, jgambogi@usgs.gov, fax: (703) 648-7722]

TITANIUM AND TITANIUM DIOXIDE

Events, Trends, and Issues: In 1998, domestic production of titanium pigment reached 1.36 million tons, a slight increase compared with 1997. Although imports increased slightly, exports of titanium pigment increased 6% compared with 1997. Apparent consumption of titanium pigment was unchanged, and published prices of rutile-grade pigment increased 8%. Consumption of titanium sponge metal products was nearly unchanged in 1998 compared with 1997. Domestic production of titanium ingot and mill products was expected to reach 44,000 tons and 25,900 tons, respectively.

Trends in the titanium pigment industry in 1998 indicated a move toward consolidation of ownership and expansion of capacity. In the United States, the Hamilton, MS, pigment facility was in the process of increasing chloride-route capacity by 27,000 tons per year. Meanwhile, ownership of the Lake Charles, LA, pigment facility moved from a joint venture to a wholly owned venture by one of the joint-venture companies.

In the titanium metal industry, the cancellation of aircraft orders indicated a slowing in demand for titanium metal products. The International Trade Administration (ITA) issued a revocation of antidumping findings on titanium sponge from Russia, Kazakhstan, and Ukraine, and the antidumping duty order on titanium sponge from Japan. In its determination, the ITA concluded that these revocations are not likely to lead to a continuation or recurrence of material injury to an industry in the United States. The Defense National Stockpile Center continued to solicit offers for the sale of titanium sponge held in the Government stockpile. For fiscal year 1999, 4,540 tons of titanium sponge were being offered for sale.

World Sponge Metal Production and Sponge and Pigment Capacity:

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	Sponge production		Capacity 1998 ⁶	
	<u>1997</u>	<u>1998°</u>	Sponge	Pigment
United States	W	W	21,600	1,491,000
Australia	_	_	_	164,000
Belgium	_	_	_	80,000
Canada	_	_	_	91,000
Chinae	2,000	2,000	7,000	45,000
Finland	_	_	_	80,000
France	_	_	_	225,000
Germany	_	_	_	350,000
Italy	_	_	_	80,000
Japan	21,100	24,000	25,800	326,000
Kazakhstan ^e	10,000	9,000	26,000	1,000
Russia ^e	18,000	17,000	30,000	20,000
Spain	_	-	_	65,000
Ukraine ^e	_	-	_	120,000
United Kingdom ^e	_	-	_	275,000
Other countries		<u>=</u>		<u>585,000</u>
World total (may be rounded)	⁷ 51,000	⁷ 52,000	110,000	4,000,000

<u>World Resources</u>: 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.

<u>Substitutes</u>: 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 TiO₂ pigment.

^eEstimated. E Net exporter. W Withheld to avoid disclosing company proprietary data.

¹See also Ilmenite and Rutile.

²Exports of sponge metal only. In previous reports all forms of metal exports were reported.

³Defined as imports - exports + adjustments for Government and industry stock changes.

⁴See Appendix B.

⁵See Appendix C for definitions.

⁶Operating capacity.

⁷Excludes U.S. production.