TITANIUM AND TITANIUM DIOXIDE[1]

(Data in metric tons unless otherwise noted)

Domestic Production and Use: Titanium sponge metal was produced by two operations in Nevada and Utah. Production data were withheld to avoid disclosing company proprietary data. The facility in Salt Lake City, UT, with an estimated capacity of 500 tons per year, produced titanium that was further refined for use in electronics. Sponge operations in Henderson, NV, with an estimated capacity of 12,600 tons per year, were idled at yearend owing to market conditions. A third operation, in Rowley, UT, with an estimated capacity of 10,900 tons per year, remained on care-and-maintenance status since 2016.

Although detailed 2020 consumption data were withheld to avoid disclosing proprietary data, the majority of titanium metal was used in aerospace applications, and the remainder was used in armor, chemical processing, marine hardware, medical implants, power generation, consumer, and other applications. The value of imported sponge was about $206 million, a 24% decrease compared with imports in 2019.

In 2020, titanium dioxide (TiO_2) pigment production, by four companies operating five facilities in four States, was valued at about $3 billion. The estimated end-use distribution of TiO_2 pigment consumption was paints (including lacquers and varnishes), 60%; plastics, 20%; paper, 5%; and other, 15%. Other uses of TiO_2 included catalysts, ceramics, coated fabrics and textiles, floor coverings, printing ink, and roofing granules.

Salient Statistics—United States:	**2016**	**2017**	**2018**	**2019[e]**	**2020[e]**
Titanium sponge metal:					
Production	W	W	W	W	W
Imports for consumption	16,200	24,100	23,700	30,000	24,000
Exports	724	3,090	533	869	910
Consumption, reported	34,100	37,400	35,200	W	W
Price, dollars per kilogram, yearend	9.50	9.10	9.20	6.85	6.90
Stocks, industry, yearend[e]	25,100	13,200	10,700	W	W
Employment, number[e]	150	150	150	150	150
Net import reliance[2] as a percentage of reported consumption	45	88	73	>50	>50
Titanium dioxide pigment:					
Production	1,240,000	1,260,000	1,150,000	1,150,000	1,000,000
Imports for consumption	247,000	240,000	269,000	226,000	270,000
Exports	651,000	634,000	528,000	411,000	370,000
Consumption, apparent[3]	840,000	870,000	893,000	965,000	900,000
Producer price index (1982=100), yearend[4]	175	205	205	NA	NA
Employment, number[e]	3,110	3,110	3,050	3,050	3,100
Net import reliance[2] as a percentage of apparent consumption	E	E	E	E	E

Recycling: About 45,000 tons of titanium scrap metal was consumed in 2020—35,000 tons by the titanium industry, 8,000 tons by the steel industry, less than 500 tons by the superalloy industry, and the remainder in other industries.

Import Sources (2016–19): Sponge metal: Japan, 90%; Kazakhstan, 7%; Ukraine, 2%; and other, 1%. Titanium dioxide pigment: Canada, 38%; China, 22%; Germany, 9%; Belgium, 4%; and other, 27%.

Tariff: Item	**Number**	**Normal Trade Relations 12–31–20**
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	8108.20.0010	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.

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TITANIUM AND TITANIUM DIOXIDE

Depletion Allowance: Not applicable.

Government Stockpile: None.

Events, Trends, and Issues: Owing to airline travel concerns and restrictions implemented to limit the spread of the global COVID-19 pandemic, domestic consumption of titanium sponge in 2020 decreased significantly compared with that of 2019. U.S. producers of titanium ingot continued to rely heavily on imports of titanium sponge and scrap. Imports of titanium sponge decreased by about 20%, and exports increased moderately. Japan (88%) and Kazakhstan (10%) were the leading import sources for titanium sponge in 2020. U.S. imports of titanium waste and scrap were about 18,000 tons. Germany (19%), Japan (18%), the United Kingdom (14%), and France (11%) were the leading import sources for titanium waste and scrap in 2020. At yearend, plans to idle the 12,600-ton-per-year sponge plant in Henderson, NV, left the 500-ton-per-year Salt Lake City, UT, plant as the only active domestic producer of titanium sponge. The U.S. Department of Commerce led investigations under section 232 of the Trade Expansion Act of 1962 that determined titanium sponge imports into the United States threatened to impair national security. In 2020, a working group was formed to explore measures to ensure access to titanium sponge in the United States for use for national defense and in critical industries during an emergency. In China, production of titanium sponge increased significantly in 2020, and projects to increase titanium sponge and titanium pigment capacity were expected in 2021.

Domestic production of TiO_2 pigment in 2020 was estimated to be about 1 million tons. Although heavily reliant on imports of titanium mineral concentrates, the United States was a net exporter of TiO_2 pigments. Following a record high of 743,000 tons in 2011, exports of titanium dioxide have followed a declining trend. Since 2011, an increasing percentage of domestic production has been used domestically in lieu of being exported.

World Sponge Metal Production and Sponge and Pigment Capacity:

	Sponge production[e]		Capacity, 2020[5]	
	2019	2020	Sponge	Pigment
United States	W	W	13,100	1,370,000
Australia	—	—	—	260,000
Canada	—	—	—	104,000
China	85,000	110,000	158,000	4,000,000
Germany	—	—	—	472,000
India	250	250	500	108,000
Japan	49,000	50,000	68,800	314,000
Kazakhstan	16,000	15,000	26,000	1,000
Mexico	—	—	—	300,000
Russia	44,000	33,000	46,500	55,000
Saudi Arabia	100	500	15,600	210,000
Ukraine	8,000	6,000	12,000	120,000
United Kingdom	—	—	—	315,000
Other countries	—	—	—	784,000
World total (rounded)	[6]200,000	[6]210,000	341,000	8,400,000

World Resources:[7] Reserves and resources of titanium minerals are discussed in the Titanium Mineral Concentrates chapter.

Substitutes: Few materials 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.

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

[1]See also Titanium Mineral Concentrates.

[2]Defined as imports – exports.

[3]Defined as production + imports – exports.

[4]U.S. Department of Labor, Bureau of Labor Statistics.

[5]Yearend operating capacity.

[6]Excludes U.S. production.

[7]See Appendix C for resource and reserve definitions and information concerning data sources.