

# Mineral Industry Surveys

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**For information, contact:**

Joseph Gambogi, Titanium Commodity Specialist  
U.S. Geological Survey  
983 National Center  
Reston, VA 20192  
Telephone: (703) 648-7718, Fax: (703) 648-7975  
E-mail: jgambogi@usgs.gov

Robin Kaiser (Data)  
Telephone: (703) 648-7948  
Fax: (703) 648-7792  
E-mail: rkaiser@usgs.gov

**Internet:** <http://minerals.usgs.gov/minerals>

## TITANIUM IN THE SECOND QUARTER 2005

According to the U.S. Geological Survey (USGS), titanium mill product shipments in the second quarter of 2005 were 5,910 metric tons (t), an 8% decrease compared with shipments in the previous quarter. Receipts of titanium scrap totaled 4,900 t, a 21% decrease compared with receipts from the previous quarter.

Allegheny Technologies Inc. (ATI) announced it would expand its titanium production capabilities in several areas. In the first half of 2006, ATI plans to restart 3,400 metric tons per year (t/yr) of capacity at its sponge plant in Albany, OR, which has been idle since 2001. By late 2006, a new plasma cold hearth furnace for the production of titanium ingot is scheduled to be completed. ATI hopes to increase its overall titanium production by 25% by upgrading its ingot, plate, sheet, and strip facilities (Allegheny Technologies Inc., 2005<sup>1</sup>).

In recognition of the Ukrainian government's efforts to increase the protection of intellectual property rights, the U.S. Trade Representative (USTR) announced the removal of a 100% ad valorem tariff duty that had been imposed on Ukrainian exports to the United States since 2002. Titanium dioxide (TiO<sub>2</sub>) pigments were listed among the sanctioned items; however, titanium sponge was not listed. The USTR also announced a review of Ukraine's eligibility for Generalized System of Preferences (GSP) benefits (U.S. Department of State, 2005<sup>§</sup>). Ukraine's GSP status was suspended in 2001. Under the GSP program, selected products such as TiO<sub>2</sub> pigment and wrought titanium metal are eligible to enter the United States duty-free. Ukraine's TiO<sub>2</sub> pigment producers (Crimea Titan Ltd. and Sumykhimprom) produce TiO<sub>2</sub> using the sulfate process and have a combined capacity of about 120,000 t/yr.

<sup>1</sup>References that include a section mark (§) are found in the Internet References Cited section.

Data for titanium metal products are developed by the USGS from a voluntary survey of domestic operations. Data for nonrespondents were estimated based on previously reported data. Data were collected from or estimated for the following companies:

Alcoa Inc. (Howmet)  
Allegheny Technologies, Inc. (Allvac)  
AstroCosmos Metallurgical, Inc.  
Carlton Forge Works  
CERAC Inc.  
Dynamet Inc.  
Haynes International, Inc.  
Ladish Co., Inc.  
NF&M International  
Precision Cast Parts Corp.  
Precision Rolled Parts Inc.  
RMI Titanium Co.  
Sandvik Special Metals Corp.  
Schultz Steel Co.  
Selmet Inc.  
Titanium Metals Corp.  
Western Pneumatic Tube Co.  
Western Zirconium, Division of Westinghouse Electric Co.

### Internet References Cited

Allegheny Technologies Inc., 2005 (July 15), Allegheny Technologies announces major expansion of its titanium capabilities, accessed September 14, 2005, at URL <http://www.investquest.com/iq/a/ati/ne/news/ati071505titanium.htm>.  
U.S. Department of State, 2005 (September 2), U.S. Trade Representative lifts tariff sanctions against Ukraine, accessed September 14, 2005, at URL <http://usinfo.state.gov/eur/Archive/2005/Sep/02-485714.html>.

TABLE 1  
COMPONENTS OF U.S. TITANIUM METAL SUPPLY AND DEMAND<sup>1</sup>

(Metric tons)

	2004				2005		
	Second quarter	Third quarter	Fourth quarter	Year to date	First quarter	Second quarter	Year to date
<b>Production:</b>							
Sponge	W	W	W	W	W	W	W
Ingot	11,400	9,760	9,840	41,400	11,600	13,300	24,800
Mill products	6,690	6,640	6,650	26,300	7,780	7,540	15,300
<b>Exports:</b>							
Waste and scrap <sup>2</sup>	1,260	2,070	4,450	9,780	7,260 <sup>3</sup>	4,440 <sup>3</sup>	11,700 <sup>3</sup>
Sponge	719	380	552	2,410	693	454	1,150
Ingot	172	308	300	951	345	355	699
Other unwrought	119	94	65	430	189	187	376
Bar, rod, profiles, wire	812	878	915	3,310	866	855	1,720
Billet	66	41	41	179	69 <sup>3</sup>	54 <sup>3</sup>	124 <sup>3</sup>
Bloom, sheet bar, slab	87	126	105	375	104 <sup>3</sup>	100 <sup>3</sup>	204 <sup>3</sup>
Other wrought	1,250	1,210	1,440	4,990	1,430	1,400	2,820
Total	4,480	5,110	7,870	22,400	11,000	7,840	18,800
<b>Imports:</b>							
Waste and scrap	2,280	2,560	2,480	8,830	2,660	3,720	6,390
Sponge <sup>3</sup>	3,510	2,680	3,050	11,900	4,250	3,630	7,880
Ingot	381	491	394	1,540	542	666	1,210
Powder	30	30	63	142	27	14	41
Other unwrought	214	268	274	959	348	433	781
Wrought	804	750	802	3,230	673	1,030	1,700
Other articles of titanium	103	68	89	365	135	93	228
Total	7,320	6,840	7,150	26,900	8,640	9,590	18,200
<b>Stocks, end of period:</b>							
Sponge, Government	4,580	2,530	2,510	XX	687	687	XX
Sponge, industry	6,340	8,360	7,660	XX	6,870	6,080	XX
Scrap	5,030	7,020	7,030	XX	6,680	7,710	XX
Ingot	4,320	3,580	3,040	XX	4,020	4,610	XX
<b>Consumption:</b>							
Sponge	5,330	5,200	5,230	21,600	6,060	7,550	13,600
Scrap	4,620	4,690	4,680	18,500	6,420	6,180	12,600
Ingot	7,170	9,620	9,460	33,800	8,670	10,500	19,200
<b>Shipments:</b>							
Ingot (net shipments)	2,250	2,460 <sup>r</sup>	2,110	8,300 <sup>r</sup>	2,060	2,440	4,500
<b>Mill products (net shipments):</b>							
Forging and extrusion billet	1,580	1,590	1,620	6,510	2,280	2,040	4,320
Plate, sheet, strip	1,840	2,060	2,200	7,940	2,580	2,500	5,070
Bar, rod, fastener stock, wire	1,200	1,110	1,320	4,670	1,390	1,280	2,660
Other <sup>4</sup>	49	30	28	196	211	92	303
Total	4,670	4,800	5,170	19,300	6,450	5,910	12,400
Castings	119	106	W	W	W	W	W
<b>Receipts, scrap:</b>							
Home	1,590	2,840	1,760	7,730	1,510	1,180	2,690
Purchased	3,980	4,840	3,460	16,500	4,690	3,720	8,420
Total	5,570	7,680	5,220	24,200	6,210	4,900	11,100

<sup>r</sup>Revised. W Withheld to avoid disclosing company proprietary data. XX Not applicable.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>All or part of these data have been referred to the U.S. Census Bureau for verification.

<sup>3</sup>In 2005, the trade classifications for "billet," "bloom, sheet bar, and slab," and "waste and scrap" were removed from the unwrought heading.

<sup>4</sup>Estimated by the U.S. Geological Survey.

<sup>5</sup>Data for pipe and tube and other have been combined to avoid disclosing company proprietary data.

TABLE 2  
U.S. EXPORTS OF TITANIUM PRODUCTS<sup>1</sup>

(Metric tons)

	2004				2005		
	Second quarter	Third quarter	Fourth quarter	Year to date	First quarter	Second quarter	Year to date
<b>Metal:</b>							
Waste and scrap	(2)	(2)	(2)	(2)	7,260	4,440	11,700
<b>Unwrought:</b>							
Sponge	719	380	552	2,410	693	454	1,150
Waste and scrap <sup>3</sup>	1,260	2,070	4,450	9,780	(2)	(2)	(2)
Ingot	172	308	300	951	345	355	699
Billet	66	41	41	179	(2)	(2)	(2)
Bloom, sheet bar, slab	87	126	105	375	(2)	(2)	(2)
Other unwrought	119	94	65	430	189	187	376
<b>Wrought:</b>							
Bar, rod, profiles, wire	812	878	915	3,310	866	855	1,720
Billet	(2)	(2)	(2)	(2)	69	54	124
Bloom, sheet bar, slab	(2)	(2)	(2)	(2)	104	100	204
Other	1,250	1,210	1,440	4,990	1,430	1,400	2,820
Ferrotitanium and ferrosilicon titanium	760	504	1,290	2,790	892	1,340	2,230
Ores and concentrates	1,940	3,380	2,450	8,690	1,420	1,920	3,350
<b>Pigment:</b>							
80% or more titanium dioxide	154,000	146,000	146,000	576,000	125,000	142,000	267,000
Other titanium dioxide	11,700	7,100	6,370	36,900	6,710	6,150	12,900
Unfinished titanium dioxide <sup>5</sup>	5,030	4,270	6,570	22,000	4,520	3,610	8,120

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>In 2005, the trade classifications for "billet," "bloom, sheet bar, and slab," and "waste and scrap" were removed from the unwrought heading.

<sup>3</sup>All or part of these data have been referred to the U.S. Census Bureau for verification.

<sup>4</sup>Estimated by the U.S. Geological Survey.

<sup>5</sup>Unmixed and not surface treated.

Source: U.S. Census Bureau.

TABLE 3  
U.S. IMPORTS FOR CONSUMPTION OF TITANIUM METAL<sup>1</sup>

(Metric tons)

	2004				2005		
	Second quarter	Third quarter	Fourth quarter	Year to date	First quarter	Second quarter	Year to date
<b>Waste and scrap:</b>							
Belgium	12	43	30	116	9	34	43
Canada	239	209	266	835	318	233	551
China	50	37	28	135	19	30	49
France	266	188	257	941	317	871	1,190
Germany	492	457	427	1,620	258	470	728
Hong Kong	159	18	--	291	--	--	--
Israel	36	64	117	268	55	42	97
Japan	469	990	601	2,340	832	849	1,680
Taiwan	233	73	188	641	110	153	263
United Kingdom	276	308	432	1,210	444	672	1,120
Other	48	172	135	429	303	370	673
<b>Total</b>	<b>2,280</b>	<b>2,560</b>	<b>2,480</b>	<b>8,830</b>	<b>2,660</b>	<b>3,720</b>	<b>6,390</b>
<b>Unwrought:</b>							
<b>Sponge:</b>							
Japan	1,250	1,060	1,130	4,600	1,600	1,270	2,870
Kazakhstan <sup>c</sup>	1,800	1,130	1,500	5,670	2,340	2,060	4,400
Russia	441	366	380	1,380	317	284	602
Other <sup>2</sup>	17	124	37	205	--	17	17
<b>Total</b>	<b>3,510</b>	<b>2,680</b>	<b>3,050</b>	<b>11,900</b>	<b>4,250</b>	<b>3,630</b>	<b>7,880</b>
<b>Ingot:</b>							
Belgium	10	--	--	10	15	5	20
France	--	--	--	--	22	23	45
Germany	97	87	69	271	69	108	177
Russia	273	333	294	1,150	394	513	907
Ukraine	--	42	25	68	40	17	57
United Kingdom	--	19	6	28	3	--	3
Other	--	10	--	10	--	--	--
<b>Total</b>	<b>381</b>	<b>491</b>	<b>394</b>	<b>1,540</b>	<b>542</b>	<b>666</b>	<b>1,210</b>
Powder	30	30	63	142	27	14	41
Other	214	268	274	959	348	433	781
<b>Wrought:</b>							
Bar, rod, profiles, wire	638	389	432	2,070	305	280	585
Billet	(3)	(3)	(3)	(3)	29	112	141
Bloom, sheet bar, slab	(3)	(3)	(3)	(3)	104	156	261
Plate, sheet, strip, foil	129	150	178	642	127	119	246
Tube and pipe	16	34	36	116	51	75	126
Other	21	177	156	397	57	288	346
<b>Total</b>	<b>804</b>	<b>750</b>	<b>802</b>	<b>3,230</b>	<b>673</b>	<b>1,030</b>	<b>1,700</b>
<b>Other articles of titanium:</b>							
Castings	(4)	5	22	29	23	3	26
Other	102	63	67	336	112	90	202
<b>Ferrotitanium and ferrosilicon titanium</b>	<b>2,380</b>	<b>1,620</b>	<b>1,720</b>	<b>6,940</b>	<b>2,460</b>	<b>10,700</b> <sup>2</sup>	<b>13,100</b>

<sup>c</sup>Estimated. -- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>All or part of these data have been referred to the U.S. Census Bureau for verification.

<sup>3</sup>In 2005, the U.S. Census Bureau created new import trade classifications for "billet" and "bloom, sheet bar, and slab."

<sup>4</sup>Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 4  
U.S. IMPORTS FOR CONSUMPTION OF TITANIUM CONCENTRATES<sup>1</sup>

(Metric tons)

	2004				2005		
	Second quarter	Third quarter	Fourth quarter	Year to date	First quarter	Second quarter	Year to date
<b>Ilmenite:</b>							
Australia	10,000	17,400	20,000	120,000	36,800	46,700	83,600
South Africa	--	26,700	--	26,700	--	--	--
Ukraine	29,900	20,000	20,100	70,000	19,000	--	19,000
Vietnam	--	--	17,000	27,000	--	--	--
<b>Total</b>	<b>39,900</b>	<b>64,100</b>	<b>57,100</b>	<b>244,000</b>	<b>55,800</b>	<b>46,700</b>	<b>103,000</b>
<b>Titanium slag:</b>							
Canada	75,000	22,000	7,540	122,000	36,500	75,500	112,000
South Africa	120,000	44,300	115,000	335,000	43,000	123,000	166,000
Other <sup>2</sup>	--	--	97	97	20,000	--	20,000
<b>Total</b>	<b>195,000</b>	<b>66,300</b>	<b>122,000</b>	<b>457,000</b>	<b>99,500</b>	<b>198,000</b>	<b>298,000</b>
<b>Rutile:</b>							
Australia	993	19,500	7,280	57,100	5,480	9,980	15,500
Canada	276	5,020	5,150	10,400	--	292	292
South Africa	26,400	29,400	45,400	147,000	36,000	38,700	74,700
Ukraine	80	220	224	684	140	5,100	5,240
Other <sup>2</sup>	100	62	184	406	20	201	221
<b>Total</b>	<b>27,800</b>	<b>54,200</b>	<b>58,200</b>	<b>216,000</b>	<b>41,600</b>	<b>54,300</b>	<b>95,900</b>
<b>Synthetic rutile:</b>							
Australia	64,800	25,500	24,200	138,000	15,000	67,400	82,400
Malaysia	549	4,850	--	5,440	9,670	56	9,730
Other <sup>2</sup>	2	--	--	60	4	--	4
<b>Total</b>	<b>65,400</b>	<b>30,300</b>	<b>24,200</b>	<b>144,000</b>	<b>24,700</b>	<b>67,400</b>	<b>92,200</b>
Titaniferous iron ore, Canada	25,500	43,200	--	68,700	--	--	--

-- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>All or part of these data have been referred to the U.S. Census Bureau for verification.

Source: U.S. Census Bureau.

TABLE 5  
U.S. IMPORTS FOR CONSUMPTION OF TITANIUM PIGMENT<sup>1</sup>

(Metric tons)

	2004				2005		
	Second quarter	Third quarter	Fourth quarter	Year to date	First quarter	Second quarter	Year to date
<b>80% or more titanium dioxide:</b>							
Australia	1,570	1,090	700	3,360	791	800	1,590
Belgium	2,300	924	1,800	7,340	1,160	3,280	4,440
Canada	19,000	19,000	15,900	71,800	18,500	20,600	39,000
China	2,190	2,070	2,990	9,190	5,290	7,710	13,000
Czech Republic	468	231	87	1,080 <sup>r</sup>	142	137	279
Finland	2,200	3,140	3,070	9,700	4,370	3,340	7,710
France	1,490	289	1,480	4,680 <sup>r</sup>	2,690	2,140	4,830
Germany	4,310	2,850	3,340	13,200	3,380	4,900	8,280
Italy	2,970	2,150	2,150	10,100	2,660	2,340	5,000
Japan	1,980	1,640	1,350	6,790	1,880	1,560	3,440
Korea, Republic of	1,540	2,980	3,620	9,100 <sup>r</sup>	4,920	2,190	7,110
Mexico	3,980	5,500	3,550	16,400	2,990	3,080	6,060
Netherlands	1,400	2,160	1,590	5,350	658	1,560	2,220
Norway	1,030	1,860	1,580	5,630	1,590	670	2,260
Singapore	653	562	585	2,240 <sup>r</sup>	486	708	1,200
Slovenia	769	432	777	2,440	594	713	1,310
South Africa	1,660	--	15	3,260	--	--	--
Spain	1,570	2,520	1,730	8,750	2,630	1,760	4,400
United Kingdom	1,050	1,300	1,810	7,770	5,180	9,220	14,400
Other	259	189	97	700	206	1,290	1,490
Total	52,400	50,800	48,200	199,000	60,100	68,000	128,000
<b>Other titanium dioxide:</b>							
Canada	436	580	477	1,960	643	553	1,200
China	281	286	389	1,070	279	133	412
Other	507	744	628	2,350	814	919	1,730
Total	1,220	1,610	1,490	5,370	1,740	1,610	3,340
<b>Unfinished titanium dioxide:<sup>2</sup></b>							
Canada	--	--	10	10	--	15,500	15,500
China	2,580	2,740	2,750	10,800	3,230	3,740	6,970
Czech Republic	1,230	1,550	1,520	5,350	2,110	1,820	3,930
France	3,360	5,240	4,770	17,400	6,280	3,360	9,630
Germany	1,950	2,310	3,340	9,980	2,260	1,390	3,650
Poland	180	80	--	460	--	--	--
South Africa	--	--	12,900	12,900	--	--	--
Other	438	662	936 <sup>r</sup>	2,290 <sup>r</sup>	1,340	17,200	18,600
Total	6,690	12,600	26,300	59,300	15,200	27,500	42,700
Grand total	63,300	65,000	76,000	264,000	77,000	97,100	174,000

<sup>r</sup>Revised. -- Zero.

<sup>1</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>2</sup>Unmixed and not surface treated.

Source: U.S. Census Bureau.

TABLE 6  
PRICES FOR TITANIUM MATERIALS

	2004						2005			
	Second quarter		Third quarter		Fourth quarter		First quarter		Second quarter	
Ilmenite, per metric ton, f.ob. Australian ports <sup>1</sup>	\$80-	\$100	\$80-	\$100	\$72-	\$90	\$72-	\$90	\$75-	\$85
Titanium slag, per metric ton: <sup>2</sup>	357-	464	357-	464	347-	466	365-	555	400-	555
Rutile, per metric ton, natural: <sup>1</sup>										
Bagged, f.o.b. Australian ports	485-	550	550-	650	550-	650	500-	700	500-	750
Bulk, f.o.b. Australian ports	434-	467	434-	467	430-	480	430-	480	450-	480
Sponge metal, per pound, import <sup>2</sup>		3.40	2.73-	4.72	3.55-	6.44	2.69-	5.90	4.68-	7.05
Titanium scrap, per pound, turnings, unprocessed (Ti-6Al-4V) <sup>3</sup>	2.50-	2.55	3.10-	3.40	3.80-	4.00	7.25-	7.50	4.45-	4.70
Ferrotitanium, per pound, 70% (max. 4.5% Al) per pound Ti <sup>3</sup>	4.70-	5.10	5.50-	5.70	6.35-	6.45	16.00-	17.00	8.00-	8.95
Titanium dioxide pigment, producer price index <sup>4</sup>		147.3		149.8		158.3		160.7		157.9

<sup>1</sup>Source: Industrial Minerals (London).

<sup>2</sup>Unit value based on land-duty-paid U.S. imports for consumption.

<sup>3</sup>Source: Platts Metals Week.

<sup>4</sup>Source: U.S. Department of Labor, Bureau of Labor Statistics.