

# Mineral Industry Surveys

#### For information, contact:

Joseph Gambogi, Titanium Commodity Specialist U.S. Geological Survey 989 National Center Reston, VA 20192 Telephone: (703) 648-7718, Fax: (703) 648-7757 E-mail: jgambogi@usgs.gov Elsie D. Isaac (Data) Telephone: (703) 648-7966 Fax: (703) 648-7792 E-mail: eisaac@usgs.gov

Internet: http://minerals.usgs.gov/minerals

### TITANIUM IN THE FOURTH QUARTER 2011

Titanium mill product shipments in the fourth quarter of 2011 were 9,720 metric tons (t), a 13% decrease compared with shipments in the previous quarter. Ingot production increased by 10%, and ingot shipments decreased by 14%. Receipts of titanium scrap totaled 11,400 t, unchanged compared with receipts from the previous quarter.

In the fourth quarter, approximately 67% of mill products and castings was produced for commercial and military aerospace

applications. Other applications for titanium mill products and castings included, in descending order, industrial, medical, other commercial, nonaerospace military, and consumer. 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.

## TABLE 1 COMPONENTS OF U.S. TITANIUM METAL SUPPLY AND DEMAND $^{\rm 1}$

#### (Metric tons)

Production:         N         N         N         N         N           Sponge         W         W         W         W         W         W           Ingot         15,100         56,400         14,500         13,800         15,200         16,0           Waste and scrap         9,580         36,300         9,660         9,860         11,300         9,2           Exports:		2	010						
Production:         N         N         N         N         N           Ingot         15,100         56,400         14,500         13,800         15,000         9,960         11,300         9,           Exports:         9,580         36,300         9,660         9,860         11,300         9,           Exports:         9,580         36,300         9,660         9,860         11,300         9,           Exports:         9         23,345         60         3,6         11,300         9,           Waste and scrap         51         467         36         29         29         0           Other nuwrought         516         2,570         59         82         182         21           Billet         741         2,240         781         889         938         31           Other wrought         2,380         8,450         2,960         3,960         3,430         3,430         34,30         32,40         9,           Ingot         117         237         105         196         115         32         34,30         34,30         34,30         34,30         35         23         34,30         35         12 <t< th=""><th></th><th colspan="2">1</th><th></th><th></th><th></th><th></th><th colspan="2">1st quarter-</th></t<>		1						1st quarter-	
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$		4th quarter	4th quarter	1st quarter	2nd quarter	3rd quarter	4th quarter	4th quarter	
ligot         15,100         56,400         14,500         13,800         15,200         16, Mill products           Smorts:         9,580         36,300         9,660         9,860         11,300         9;           Exports:         9,580         36,300         9,660         9,860         11,300         9;           Exports:         9,580         36,300         9,660         9,860         11,300         9;           Sponge         55         293         45         60         36         14,60         3,480         1,240         1,230         1,310         1,           Other unwrought         516         2,570         59         82         182         2         13         1467         36         29         29         14         14         2,440         781         889         938         14         14         14         2,440         781         889         938         15         1467         36         14,90         4,         4,490         4,         4,490         4,         15         14,60         1,30         35         14,90         4,30         3,5         14,90         4,30         3,5         15         15         15         15	oduction:	=							
Mill products         9,580         36,300         9,660         9,860         11,300         9;           Exports:	Sponge	W	W	W	W	W	W	W	
Exports:         1.460         3.480         1.240         1.230         1.310         1.           Sponge         55         293         45         60         36           Ingot         51         467         36         29         29           Other unwrought         516         2,570         59         82         182         55           Bar, rod, profiles, wire         799         2,830         893         1,000         861         1,1           Billet         741         2,240         781         889         938         5           Boom, sheet bar, slab         472         1,240         279         326         390         5           Total         6,470         21,600         6,290         7,590         8,240         9,           Inports:	ingot	15,100	56,400	14,500	13,800	15,200	16,800	60,300	
Waste and scrap         1,460         3,480         1,240         1,230         1,310         1, 310           Sponge         55         293         45         60         36           Ingot         51         467         36         29         29           Other unwrought         516         2,570         59         82         182         33           Bar, rod, profiles, wire         799         2,830         893         1,000         861         1,           Billet         741         2,240         781         889         938         33           Bloom, sheet bar, slab         472         1,240         279         326         390         34           Other wrought         2,380         8,450         2,960         3,980         4,490         4,           Total         6,470         21,600         6,290         7,590         8,240         9,           Ingot         117         237         105         196         115         32           Waste and scrap         2,820         10,700         2,670         3,960         3,430         3,5           Ingot         117         237         105         196	Mill products	9,580	36,300	9,660	9,860	11,300	9,720	40,500	
Sponge55293456036Ingot51467362929Other unwrought5162,570598218236Bar, rod, profiles, wire7992,8308931,0008611,Billet7412,24078188993836Bioon, sheet bar, slab4721,24027932639037Other wrought2,3808,4502,9603,9804,4904,Total6,47021,6006,2907,5908,2409,Inports:2,82010,7002,6703,9603,4303,Sponge <sup>2</sup> 6,42020,5007,1607,9108,7309,Ingot11723710519611532Other unwrought138843552332Wrought138843552332Other on wrought11,40040,30011,70014,10013,90015,Stocks, end of period:72276165158151Total11,40040,30011,70014,10013,90015,Sponge9,87034,90012,60012,00012,10011,Scrap9,87034,90012,60012,00012,10011,Sponge9,87034,90012,60012,00015,80015,800Shipments:10,60040,90012,200 <td>ports:</td> <td>_</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	ports:	_							
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	Waste and scrap	1,460	3,480	1,240	1,230	1,310	1,380	5,150	
Other unwrought         516 $2,570$ $59$ $82$ $182$ $182$ Bar, rod, profiles, wire         799 $2,830$ $893$ $1,000$ $861$ $1,$ Billet         741 $2,240$ 781 $889$ $938$ $336$ Bloom, sheet bar, slab         471 $2,240$ $279$ $326$ $3900$ $326$ Other wrought $2,380$ $8,450$ $2,900$ $3,980$ $4,490$ $4,$ Total $6,470$ $21,600$ $6,290$ $7,590$ $8,240$ $9,$ Imports: $2,820$ $10,700$ $2,670$ $3,960$ $3,430$ $3,$ Sponge <sup>2</sup> $6,420$ $20,500$ $7,160$ $7,910$ $8,730$ $9,$ Ingot         117 $237$ $105$ $196$ $115$ $523$ Wrought         13 $88$ $43$ $55$ $23$ $21$ Other $72$ $276$ $165$ $158$ $51$ <td>Sponge</td> <td>55</td> <td>293</td> <td>45</td> <td>60</td> <td>36</td> <td>116</td> <td>256</td>	Sponge	55	293	45	60	36	116	256	
Bar, rod, profiles, wire7992,8308931,0008611,1Billet7412,24078188993833Bloom, sheet bar, slab4721,240279326390390Other wrought2,3808,4502,9603,9804,4904,Total6,47021,6006,2907,5908,2409,Imports: $2,820$ 10,7002,6703,9603,4303,Sponge <sup>2</sup> 6,42020,5007,1607,9108,7309,Ingot1172371051961153Powder36119623210Other unwrought1388435523Wrought1,9308,430 r1,5601,8101,4601,Castings10,004(3)35120Other722761651581511Total11,40040,30011,70014,10013,90015,Stocks, end of period:3,50010,5007,0008,4905,00010,20Sponge9,87034,90012,60012,00011,130012,2Ingot2,9202,9203,3803,4703,0003,3Consumption:99,87034,90012,60012,00012,10011,1Sponge9,87034,90012,60012,00012,10011,5Shipments:	ingot	51	467	36	29	29	157	252	
Billet         741         2,240         781         889         938         938           Bloom, sheet bar, slab         472         1,240         279         326         390         33           Other wrought         2,380         8,450         2,960         3,980         4,490         4,           Total         6,470         21,600         6,290         7,590         8,240         9,           Imports:         2,820         10,700         2,670         3,960         3,430         3,           Sponge <sup>2</sup> 6,420         20,500         7,160         7,910         8,730         9,           Ingot         117         237         105         196         115         5           Other unwrought         13         88         43         55         23         0           Wrought         1,930         8,430 <sup>+</sup> 1,560         1,810         1,460         1,5           Total         11,400         40,300         11,700         14,100         13,900         15,           Stocks, end of period:         5         5         11,400         40,300         11,700         14,100         13,900         12,600         10,00	Other unwrought	516	2,570	59	82	182	599	923	
Bloom, sheet bar, slab4721,240279326390390Other wrought2,3808,4502,9603,9804,4904,Total6,47021,6006,2907,5908,2409,Imports: $2,820$ 10,7002,6703,9603,4303,Sponge <sup>2</sup> 6,42020,5007,1607,9108,7309,Ingot1172371051961153Powder36119623211Other unwrought1388435523Wrought1,9308,430 r1,5601,8101,4601,Castings1.004(3)35121Other722761651581511Total11,40040,30011,70014,10013,90015,Sponge, industry10,50010,5007,0008,4905,00010,Scrap7,9007,9008,50010,40011,30012,Ingot2,9202,9203,3803,4703,0003,Consumption:5553329,2006,7506,9409,3207,Ingot and slab (producer net shipments):3,21013,7002,9504,3004,3903,Mill products (net shipments):3,21013,7002,9504,3004,3903,Mill products (net shipments):4,78019,7004,810 <td>Bar, rod, profiles, wire</td> <td>799</td> <td>2,830</td> <td>893</td> <td>1,000</td> <td>861</td> <td>1,300</td> <td>4,060</td>	Bar, rod, profiles, wire	799	2,830	893	1,000	861	1,300	4,060	
Other wrought         2,380         8,450         2,960         3,980         4,490         4,           Total         6,470         21,600         6,290         7,590         8,240         9,           Imports:         2,820         10,700         2,670         3,960         3,430         3,3           Sponge <sup>2</sup> 6,420         20,500         7,160         7,910         8,730         9,           Ingot         117         237         105         196         115         5           Powder         36         119         6         23         21         0ther unwrought         13         88         43         55         23           Wrought         1,930         8,430 r         1,560         1,810         1,460         1,5           Other         72         276         165         158         151         1           Total         11,400         40,300         11,700         14,100         13,900         15,           Stocks, end of period:         2         2920         2,920         3,380         3,470         3,000         3,           Gonsumption:         5         5,830         29,200         6,750	Billet	741	2,240	781	889	938	892	3,500	
Total $6,470$ $21,600$ $6,290$ $7,590$ $8,240$ $9,$ Imports:         2,820 $10,700$ $2,670$ $3,960$ $3,430$ $3,$ Sponge <sup>2</sup> $6,420$ $20,500$ $7,160$ $7,910$ $8,730$ $9,$ Ingot $117$ $237$ $105$ $196$ $115$ $23$ Other unwrought $13$ $88$ $43$ $55$ $23$ Wrought $1,930$ $8,430$ $1,560$ $1,810$ $1,460$ $1,$ Castings $1.00$ $4$ $(3)$ $35$ $12$ $0$ Other $72$ $276$ $165$ $158$ $151$ Total $11,400$ $40,300$ $11,700$ $14,100$ $13,900$ $15,$ Stocks, end of period: $7,900$ $7,900$ $7,900$ $8,490$ $5,000$ $10,$ Scrap $7,900$ $7,900$ $8,500$ $12,600$ $12,000$ $12,100$ $11$	Bloom, sheet bar, slab	472	1,240	279	326	390	562	1,560	
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	Other wrought	2,380	8,450	2,960	3,980	4,490	4,160	15,600	
Waste and scrap2,82010,7002,6703,9603,4303,3Sponge26,42020,5007,1607,9108,7309,3Ingot11723710519611515Powder3611962321Other unwrought1388435523Wrought1,9308,430 r1,5601,8101,4601,50Castings1.004(3)3512Other72276165158151Total11,40040,30011,70014,10013,90015,4Stocks, end of period:57,9007,9008,50010,40011,30012,5Scrap7,9007,9008,50010,40011,30012,710,6003,4303,4303,430Sponge9,87034,90012,60012,00012,10011,40013,90015,40015,40015,40015,400Sponge9,87034,90012,60012,00012,10011,50010,60040,90012,20015,80015,40015,400Shipments:Ingot and slab (producer net shipments)3,21013,7002,9504,3004,3903,50015,400	Total	6,470	21,600	6,290	7,590	8,240	9,170	31,300	
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	iports:	_							
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	Waste and scrap	2,820	10,700	2,670	3,960	3,430	3,880	13,900	
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	Sponge <sup>2</sup>	6,420	20,500	7,160	7,910	8,730	9,960	33,800	
Powder $36$ $119$ $6$ $23$ $21$ Other unwrought $13$ $88$ $43$ $55$ $23$ Wrought $1,930$ $8,430$ r $1,560$ $1,810$ $1,460$ $1,700$ Castings $1.00$ $4$ $(3)$ $35$ $12$ Other $72$ $276$ $165$ $158$ $151$ Total $11,400$ $40,300$ $11,700$ $14,100$ $13,900$ $15,600$ Stocks, end of period: $7,900$ $7,900$ $8,500$ $10,400$ $11,300$ $12,700$ Scrap $7,900$ $7,900$ $8,500$ $10,400$ $11,300$ $12,700$ Ingot $2,920$ $2,920$ $3,380$ $3,470$ $3,000$ $3,700$ Consumption: $5,830$ $29,200$ $6,750$ $6,940$ $9,320$ $7,700$ Ingot $10,600$ $40,900$ $12,200$ $12,100$ $11,700$ $14,300$ $15,700$ Shipments: $10,600$ $40,900$ $12,600$ $12,000$ $12,100$ $11,700$ Mill products (net shipments): $3,210$ $13,700$ $2,950$ $4,300$ $4,390$ $3,700$ Mill products (net shipments): $4,780$ $19,700$ $4,810$ $3,280$ $4,580$ $4,870$		117	237	105	196	115	239	654	
Wrought1,930 $8,430^{r}$ $1,560$ $1,810$ $1,460$ $1,760$ Castings1.004(3)3512Other72276165158151Total11,40040,30011,70014,10013,90015,158Stocks, end of period:10,50010,5007,000 $8,490$ 5,00010,10,100Storap7,9007,9007,9008,50010,40011,30012,100Ingot2,9202,9203,3803,4703,0003,100Consumption:9,87034,90012,60012,00012,10011,100Scrap9,87034,90012,60012,00012,10011,500Ingot3,21013,7002,9504,3004,3903,200Mill products (net shipments):3,21013,7002,9504,3004,5804,500Forging and extrusion billet4,78019,7004,8103,2804,5804,5505,530		-					2	52	
Wrought1,930 $8,430^{r}$ $1,560$ $1,810$ $1,460$ $1,760$ Castings1.004(3) $35$ $12$ Other72 $276$ $165$ $158$ $151$ Total11,400 $40,300$ $11,700$ $14,100$ $13,900$ $15,750$ Stocks, end of period:10,500 $10,500$ $7,000$ $8,490$ $5,000$ $10,700$ Sponge, industry10,500 $10,500$ $7,900$ $7,900$ $8,500$ $10,400$ $11,300$ $12,700$ Ingot2,920 $2,920$ $2,920$ $3,380$ $3,470$ $3,000$ $3,700$ Consumption:9,870 $34,900$ $12,600$ $12,000$ $12,100$ $11,700$ Sponge9,870 $34,900$ $12,600$ $12,000$ $12,100$ $11,700$ Ingot $3,210$ $13,700$ $2,950$ $4,300$ $4,390$ $3,700$ Mill products (net shipments): $3,210$ $13,700$ $2,950$ $4,300$ $4,580$ $4,780$ Forging and extrusion billet $4,780$ $19,700$ $4,810$ $3,280$ $4,580$ $4,780$	Other unwrought	13	88	43	55	23	86	208	
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	5	-		1,560		1,460	1,370	6,190	
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	5	1.00	4	(3)	35	12	3	51	
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$	6	-					101	574	
Stocks, end of period:         10,500         10,500         7,000         8,490         5,000         10,2           Scrap         7,900         7,900         8,500         10,400         11,300         12,2           Ingot         2,920         2,920         3,380         3,470         3,000         3,3           Consumption:         9,870         34,900         12,600         12,000         12,100         11,300           Scrap         5,830         29,200         6,750         6,940         9,320         7,3           Ingot         10,600         40,900         12,200         12,500         15,800         15,400           Shipments:         10,600         40,900         12,200         12,500         15,800         15,400           Mill products (net shipments):         3,210         13,700         2,950         4,300         4,390         3,400           Forging and extrusion billet         4,780         19,700         4,810         3,280         4,580         4,400           Other         4,870         18,500         5,530         11,100         6,550 r         5,50	Total	11,400	40,300	11.700	14.100	13,900	15,600	55,400	
$\begin{tabular}{ c c c c c c c c c c c c c c c c c c c$			- ,	· · · ·	,	- ,	- ,		
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	*	10.500	10.500	7.000	8.490	5.000	10,800	10,800	
Ingot         2,920         2,920         3,380         3,470         3,000         3,300 <th< td=""><td></td><td>-</td><td>,</td><td>,</td><td>,</td><td>,</td><td>12,900</td><td>12,900</td></th<>		-	,	,	,	,	12,900	12,900	
Consumption:         9,870         34,900         12,600         12,000         12,100         11,7           Scrap         5,830         29,200         6,750         6,940         9,320         7,7           Ingot         10,600         40,900         12,200         12,500         15,800         15,5           Shipments:         3,210         13,700         2,950         4,300         4,390         3,7           Mill products (net shipments):         5,810         19,700         4,810         3,280         4,580         4,7           Other         4,870         18,500         5,530         11,100         6,550 r         5,50	•		,				3,850	3,850	
Sponge         9,870         34,900         12,600         12,000         12,100         11,           Scrap         5,830         29,200         6,750         6,940         9,320         7,           Ingot         10,600         40,900         12,200         12,500         15,800         15,           Shipments:         3,210         13,700         2,950         4,300         4,390         3,           Mill products (net shipments):         5,730         19,700         4,810         3,280         4,580         4,           Other         4,870         18,500         5,530         11,100         6,550 r         5,	0		· · ·	- ,	- , · · ·	- ,	- ,	- ,	
Scrap         5,830         29,200         6,750         6,940         9,320         7,3           Ingot         10,600         40,900         12,200         12,500         15,800         15,300           Shipments:         Ingot and slab (producer net shipments)         3,210         13,700         2,950         4,300         4,390         3,300           Mill products (net shipments):         5         4,780         19,700         4,810         3,280         4,580         4,400           Other         4,870         18,500         5,530         11,100         6,550 r         5,50	1	9.870	34,900	12.600	12.000	12.100	11,700	48.400	
Ingot         10,600         40,900         12,200         12,500         15,800         15,500           Shipments:         Ingot and slab (producer net shipments)         3,210         13,700         2,950         4,300         4,390         3,500           Mill products (net shipments):         3,210         13,700         2,950         4,300         4,390         3,500           Forging and extrusion billet         4,780         19,700         4,810         3,280         4,580         4,500           Other         4,870         18,500         5,530         11,100         6,550 r         5,50		-	,	,	,	,	7,850	30,900	
Shipments:         3,210         13,700         2,950         4,300         4,390         3,700           Mill products (net shipments):	•	- '	,	,	,	,	15,400	55,900	
Ingot and slab (producer net shipments)         3,210         13,700         2,950         4,300         4,390         3,'           Mill products (net shipments):			10,200	12,200	12,000	10,000	10,100	22,700	
Mill products (net shipments):         4,780         19,700         4,810         3,280         4,580         4, 4,580         4, 4,870         18,500         5,530         11,100         6,550 r         5,		3.210	13,700	2.950	4.300	4.390	3,770	15,400	
Forging and extrusion billet         4,780         19,700         4,810         3,280         4,580         4,           Other         4,870         18,500         5,530         11,100         6,550 r         5,		0,210	10,700	2,,,,,,,,	1,200	1,000	5,770	10,100	
Other         4,870         18,500         5,530         11,100         6,550 r         5,		4.780	19,700	4.810	3,280	4,580	4,110	16,800	
	5 5	-	,	,	,	,	,	28,700	
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		· · · · ·					9,720	45,500	
Castings W W W W		- 1					9,720 W	45,500 W	
Receipts, scrap:	·		••	**	••		**	~~	
		2 530	9 770	W	2 990	4 140	5,200	12.300	
		- '	- ,		,	,	6,170	21,200	
					· · · ·	,	11,400	40,200	

<sup>r</sup>Revised. W Withheld to avoid disclosing company proprietary data.

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

<sup>2</sup>Estimated by the U.S. Geological Survey.

<sup>3</sup>Less than <sup>1</sup>/<sub>2</sub> unit.

<sup>4</sup>Data for second, third, and fourth quarter.

## TABLE 2U.S. EXPORTS OF TITANIUM PRODUCTS1

#### (Metric tons)

	2	2010		2011					
		1st quarter-					1st quarter-		
	4th quarter	4th quarter	1st quarter	2nd quarter	3rd quarter	4th quarter	4th quarter		
Metal:									
Waste and scrap	1,460	3,480	1,240	1,230	1,310	1,380	5,150		
Unwrought:									
Sponge	55	293	45	60	36	116	256		
Ingot	51	467	36	29	29	157	252		
Other unwrought	516	2,570	59	82	182	599	923		
Wrought:									
Bar, rod, profiles, wire	799	2,830	893	1,000	861	1,300	4,060		
Billet	741	2,240	781	889	938	892	3,500		
Bloom, sheet bar, slab	472	1,240	279	326	390	562	1,560		
Other	2,380	8,450	2,960	3,980	4,490	4,160	15,600		
Ferrotitanium and ferrosilicon titanium	695	2,570	665	987	895	664	3,210		
Ores and concentrates	4,670	18,900	7,380	7,760	8,540	2,900	26,600		
Pigment:									
80% or more titanium dioxide	190,000	717,000	177,000	181,000	204,000	179,000	741,000		
Other titanium dioxide	9,190	36,700	9,880	11,600	10,400	8,110	40,000		
Unfinished titanium dioxide <sup>2</sup>	1,260	4,160	2,230	1,640	1,830	1,460	7,160		

<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.

#### TABLE 3 U.S. IMPORTS FOR CONSUMPTION OF TITANIUM $\operatorname{METAL}^1$

#### (Metric tons)

	2	2010	2011					
	1st quarter-							
	4th quarter	4th quarter	1st quarter	2nd quarter	3rd quarter	4th quarter	4th quarter	
Waste and scrap:								
Canada	184	682	188	178	132	240	738	
France	363	1,480	349	525	447	469	1,790	
Germany	461	2,050	290	655	492	498	1,930	
Israel	82	256	106	143	173	101	523	
Italy	76	398	63	107	83	77	329	
Japan	593	1,550	590	612	418	642	2,260	
Korea, Republic of	100	416	84	106	280	185	655	
Mexico	60	151	67	125	82	96	369	
Russia	25	243	46	45	14	53	158	
Spain	34	134	47	96	38	38	220	
Taiwan	194	692	165	390	114	144	813	
United Kingdom	467	1,720	436	623	840	918	2,820	
Other	179	943	235	353	312	424	1,320	
Total	2,820	10,700	2,670	3,960	3,430	3,880	13,900	
Unwrought:	· · · · · ·	<i>.</i>	,	,	,	,	<i>.</i>	
Sponge:								
China	555	868	1,220	886	1,550	2,210	5,860	
Japan	3,240	9,790	4,150	3,610	3,690	4,620	16,100	
Kazakhstan <sup>e</sup>	2,060	8,550	1,230	2,730	2,660	2,000	8,610	
Russia	422	918	150	399	350	363	1,260	
Other <sup>2</sup>	146	331	409	279	491	775	1,960	
Total	6,420	20,500	7,160	7,910	8,730	9.960	33,800	
Ingot:	- , - ,	- ,	.,		- /	- /	,	
Germany	80	156	99	99	48	98	344	
Russia	12	12	3	91	67	141	302	
Other	25 <sup>r</sup>	69 <sup>r</sup>		7 <sup>r</sup>			9	
Total	117	237	105	196	115	239	654	
Powder	36	119	6	23	21	2	52	
Other	13	88	43	55	23	86	208	
Wrought:		00	10	00	20	00	200	
Bar, rod, profiles, wire	597	2,530	371	519	438	385	1,710	
Billet	435 <sup>r</sup>	2,010 <sup>r</sup>		260	257	187	885	
Bloom, sheet bar, slab	7	101 r		10	4	11	30	
Plate, sheet, strip, foil	762	3,320	852	876	588	591	2,910	
Tube and pipe	88	326 <sup>r</sup>			127 r		440	
Other	37	149	62	41	47	67	218	
Total	1,930	8,430 <sup>r</sup>		1,810	1,460	1,370	6,190	
Other articles of titanium:	1,750	0,430	1,500	1,010	1,400	1,570	0,190	
Castings	1	4	(3)	35	12	3	51	
Other	1 72	276	165	158	12	101	574	
	363					419		
Ferrotitanium and ferrosilicon titanium	363	2,740	475	635	544	419	2,070	

<sup>e</sup>Estimated. <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>All or part of these data have been referred to the U.S. Census Bureau for verification.  ${}^{3}$ Less than  ${}^{1}\!/_{2}$  unit.

## TABLE 4 U.S. IMPORTS FOR CONSUMPTION OF TITANIUM CONCENTRATES $^{\rm 1}$

#### (Metric tons)

	2	010		2011					
		1st quarter-					1st quarter-		
	4th quarter	4th quarter	1st quarter	2nd quarter	3rd quarter	4th quarter	4th quarter		
Ilmenite:									
Australia	44,000	98,200	53,400	57,200	77,500	55,600	244,000		
Mozambique	38,000	199,000	32,100	26,100	25,000	31,000	114,000		
Ukraine	17,600	57,500		10,000			10,000		
Other <sup>2</sup>	11,000	22,300		9,340			9,340		
Total	111,000	377,000	85,500	103,000	103,000	86,600	377,000		
Titanium slag:									
Canada	46,600	150,000	21,600	55,800	32,200	81,100	191,000		
South Africa	88,400	325,000	68,900	80,900	79,000	93,900	323,000		
Total	135,000	475,000	90,500	137,000	111,000	175,000	513,000		
Rutile:									
Australia	26,600	83,500	35,300	20,000	34,300	16,100	106,000		
Sierra Leone	10,000	29,800			19	10,100	10,100		
South Africa	28,900	96,500	23,200	47,900	22,900	39,000	133,000		
Other <sup>2</sup>	500	19,100	67	9,020	594	3,780	13,500		
Total	66,000	229,000	58,500	76,900	57,800	69,000	262,000		
Synthetic rutile:									
Australia	54,000	109,000	18,500	50,500	26,800	16,000	112,000		
Other <sup>2</sup>	36	13,600	92	704	1,260	4,900	6,960		
Total	54,100	122,000	18,600	51,200	28,100	20,900	119,000		
Titaniferous iron ore, Canada <sup>2</sup>	46,900	83,100		42	21	33	96		

-- 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.

## TABLE 5 U.S. IMPORTS FOR CONSUMPTION OF TITANIUM PIGMENT $^{\rm 1}$

#### (Metric tons)

		2010					
		1st quarter-					1st quarter-
	4th quarter	4th quarter	1st quarter	2nd quarter	3rd quarter	4th quarter	4th quarter
80% or more titanium dioxide:							
Canada	19,000	83,400	20,700	20,600	21,100	16,600	79,000
China	2,340	8,120	2,460	3,880	1,270	2,670	10,300
Finland	1,810	7,970	1,790	1,750	1,470	1,790	6,790
France	598	4,200	1,440	1,000	1,140	1,320	4,910
Germany	1,180	5,720	852	1,710	2,160	1,730	6,450
Italy	566	2,890	970	710	933	850	3,460
Japan	1,140	4,350	793	1,200	1,190	997	4,180
Netherlands	1,270	4,730	1,010	297	303	190	1,800
Ukraine	2,600	9,890	3,300	3,580	2,540	2,270	11,700
Other	4,260	13,700	2,580	3,360	3,230	2,700	11,900
Total	34,700	145,000	35,900	38,100	35,400	31,100	140,000
Other titanium dioxide:							
Canada	1,530	7,230	1,850	2,400	2,390	2,170	8,820
China	645	1,550	253	167	309	378	1,110
Germany	99	1,440	262	216	155	33	666
Japan	238	836	175	198	126	52	552
Other	289	1,060	263	290	235	241	1,030
Total	2,800	12,100	2,800	3,280	3,210	2,880	12,200
Unfinished titanium dioxide: <sup>2</sup>							
China	5,430	22,400	5,170	6,330	7,000	5,710	24,200
Czech Republic	559	2,400	689	625	627	516	2,460
Finland	745	2,960	553	842	732	789	2,910
France	1,490	4,910	1,170	1,150	1,840	1,560	5,720
Germany	1,310	4,920	1,320	1,090	1,090	770	4,270
Italy	608	2,220	970	1,010	875	268	3,120
Korea, Republic of	1,050	4,450	927	858	406	436	2,630
Other	510	2,930	749	679	327	671	2,430
Total	11,700	47,200	11,500	12,600	12,900	10,700	47,700
Grand total	49,200	204,000	50,200	53,900	51,500	44,700	200,000

<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.

## TABLE 6PRICES FOR TITANIUM MATERIALS

#### (End of period)

				20		
		2010	1st quarter	2nd quarter	3rd quarter	4th quarter
Concentrate:						
Ilmenite, f.o.b. Australian ports <sup>1</sup>	dollars per metric ton	65-85	65-85	130-150	140-250	140-250
Titanium slag, import <sup>2</sup>	do.	367–433	480–495	449–498	320-475	468–494
Rutile, natural: <sup>1</sup>						
Bagged, f.o.b. Australian ports	do.	760-805	775-820	950-1,180	1,348-1,600	1,348-1,600
Bulk, f.o.b. Australian ports	do.	530-550	625-700	750-875	1,000-1,120	1,300–1,400
Metal:						
Sponge metal, Japan, import <sup>2</sup>	dollars per pound	6.24	5.81	5.84	5.68	5.74
Titanium mill products	producer price index <sup>3</sup>	203	206	200	209	r 208
Titanium scrap, turnings, unprocessed (Ti-6Al-4V) <sup>4</sup>	dollars per pound	2.00-2.10	2.50-2.65	2.75-2.85	2.60-2.65	2.00-2.20
Ferrotitanium, 70% (max. 4.5% Al) per pound Ti <sup>4</sup>	do.	3.18-3.25	3.85-3.95	4.30-4.45	4.10-4.20	3.45-3.55
Pigment:						
Titanium dioxide pigment, import <sup>2</sup>	dollars per metric ton	2,448	2,647	2,856	3,133	3,530
Titanium dioxide pigment	producer price index <sup>3</sup>	194	213	221	251	r 271

<sup>r</sup>Revised. do. Ditto.

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

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

<sup>3</sup>June 1982=100. Source: U.S. Department of Labor, Bureau of Labor Statistics.

<sup>4</sup>Source: Platts Metals Week.