



Mineral Industry Surveys

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TITANIUM IN THE FOURTH QUARTER 2012

Titanium mill product shipments in the fourth quarter of 2012 were 8,880 metric tons (t), a 16% decrease compared with shipments in the previous quarter. Ingot production decreased by 4%, and ingot shipments increased by 7%. Receipts of titanium scrap totaled 13,400 t, an increase of 22% compared with receipts from the previous quarter.

Titanium mill product shipments in 2012 totaled 39,600 t, a 13% decrease compared with shipments in 2011. Ingot production increased by 14%, and ingot shipments increased 33%. Receipts of titanium scrap totaled 48,800 t, an increase of 21% compared with receipts in 2011.

In 2012, approximately 68% of mill products and castings were 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 US Geological Survey 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 DEMAND¹

(Metric tons)

| | 2011 | | 2012 | | | | |
|---|-------------|-----------------------------|-------------|------------|---------------------|-------------|-----------------------------|
| | 4th quarter | 1st quarter– 4th quarter | 1st quarter | 2d quarter | 3d quarter | 4th quarter | 1st quarter– 4th quarter |
| Production: | | | | | | | |
| Sponge | W | W | W | W | W | W | W |
| Ingot | 16,800 | 60,300 | 17,400 | 16,500 | 17,800 | 17,100 | 68,800 |
| Mill products | 9,720 | 40,500 | 10,000 | 10,200 | 10,700 | 8,850 | 39,800 |
| Exports: | | | | | | | |
| Waste and scrap | 1,380 | 5,150 | 2,270 | 2,900 | 1,990 | 1,610 | 8,760 |
| Sponge | 116 | 256 | 209 | 344 | 517 | 347 | 1,420 |
| Ingot | 157 | 252 | 317 | 935 | 1,380 | 1,140 | 3,760 |
| Other unwrought | 599 | 923 | 26 | 38 | 36 | 59 | 159 |
| Bar, rod, profiles, wire | 1,300 | 4,060 | 1,010 | 858 | 891 | 805 | 3,560 |
| Billet | 892 | 3,500 | 1,040 | 1,040 | 816 | 768 | 3,660 |
| Bloom, sheet bar, slab | 562 | 1,560 | 663 | 599 | 387 | 532 | 2,180 |
| Other wrought | 4,160 | 15,600 | 3,830 | 3,250 | 2,950 | 3,820 | 13,800 |
| Total | 9,170 | 31,300 | 9,360 | 9,950 | 8,970 | 9,080 | 37,400 |
| Imports: | | | | | | | |
| Waste and scrap | 3,880 | 13,900 | 4,000 | 3,950 | 3,440 | 3,050 | 14,400 |
| Sponge ² | 9,960 | 33,800 | 8,900 | 9,060 | 8,870 | 6,800 | 33,600 |
| Ingot | 239 | 655 | 221 | 147 | 55 | 87 | 510 |
| Powder | 2 | 52 | 3 | 21 | 6 | 4 | 34 |
| Other unwrought | 86 | 208 | 186 | 114 | 48 | 101 | 448 |
| Wrought | 1,360 | 6,190 | 1,650 | 1,640 | 1,540 | 1,530 | 6,360 |
| Castings | 3 | 51 | 5 | 7 | 6 | 19 | 36 |
| Other | 101 | 574 | 136 | 155 | 83 | 72 | 446 |
| Total | 15,600 | 55,400 | 15,100 | 15,100 | 14,100 | 11,700 | 55,900 |
| Stocks, end of period: | | | | | | | |
| Sponge, industry | 10,800 | 10,800 | 12,100 | 14,800 | 14,700 ^r | 18,100 | 18,100 |
| Scrap | 12,900 | 12,900 | 13,500 | 13,100 | 12,700 | 13,500 | 13,500 |
| Ingot | 3,850 | 3,850 | 3,390 | 3,400 | 3,330 | 4,170 | 4,170 |
| Consumption: | | | | | | | |
| Sponge | 11,700 | 48,400 | 8,470 | 7,890 | 11,200 ^r | 7,530 | 35,100 |
| Scrap | 7,850 | 30,900 | 8,610 | 8,660 | 10,200 | 11,200 | 38,700 |
| Ingot | 15,400 | 55,900 | 15,400 | 14,100 | 14,700 ^r | 13,100 | 57,300 |
| Shipments: | | | | | | | |
| Ingot and slab (producer net shipments) | 3,770 | 15,400 | 4,440 | 4,840 | 5,430 | 5,800 | 20,500 |
| Mill products (net shipments): | | | | | | | |
| Forging and extrusion billet | 4,110 | 16,800 | 4,190 | 4,600 | 4,350 | 3,540 | 16,700 |
| Other | 5,620 | 28,700 | 5,750 | 5,550 | 6,300 | 5,340 | 23,000 |
| Total | 9,720 | 45,500 | 9,930 | 10,100 | 10,600 | 8,880 | 39,600 |
| Castings | W | W | W | W | W | W | W |
| Receipts, scrap: | | | | | | | |
| Home | 5,200 | 12,300 ³ | 7,050 | 4,530 | 3,690 | 6,670 | 21,900 |
| Purchased | 6,170 | 21,200 ³ | 6,510 | 6,280 | 7,290 | 6,770 | 26,800 |
| Total | 11,400 | 40,200 | 13,600 | 10,800 | 11,000 | 13,400 | 48,800 |

^rRevised. W Withheld to avoid disclosing company proprietary data.

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

²Estimated by the U.S. Geological Survey.

³Data for second, third, and fourth quarter.

TABLE 2
U.S. EXPORTS OF TITANIUM PRODUCTS¹

(Metric tons)

| | 2011 | | 2012 | | | | 1st quarter– 4th quarter |
|--|-------------|-----------------------------|-------------|------------|------------|-------------|-----------------------------|
| | 4th quarter | 1st quarter– 4th quarter | 1st quarter | 2d quarter | 3d quarter | 4th quarter | |
| Metal: | | | | | | | |
| Waste and scrap | 1,380 | 5,150 | 2,270 | 2,900 | 1,990 | 1,610 | 8,760 |
| Unwrought: | | | | | | | |
| Sponge | 116 | 256 | 209 | 344 | 517 | 347 | 1,420 |
| Ingot | 157 | 252 | 317 | 935 | 1,380 | 1,140 | 3,760 |
| Other unwrought | 599 | 923 | 26 | 38 | 36 | 59 | 159 |
| Wrought: | | | | | | | |
| Bar, rod, profiles, wire | 1,300 | 4,060 | 1,010 | 858 | 891 | 805 | 3,560 |
| Billet | 892 | 3,500 | 1,040 | 1,040 | 816 | 768 | 3,660 |
| Bloom, sheet bar, slab | 562 | 1,560 | 663 | 599 | 387 | 532 | 2,180 |
| Other | 4,160 | 15,600 | 3,830 | 3,250 | 2,950 | 3,820 | 13,800 |
| Ferrotitanium and ferrosilicon titanium | 664 | 3,210 | 760 | 1,080 | 1,060 | 705 | 3,610 |
| Ores and concentrates | 2,900 | 26,600 | 3,460 | 6,390 | 17,100 | 16,000 | 43,000 |
| Pigment: | | | | | | | |
| 80% or more titanium dioxide | 179,000 | 741,000 | 178,000 | 145,000 | 151,000 | 112,000 | 587,000 |
| Other titanium dioxide | 8,110 | 40,000 | 9,260 | 10,600 | 9,180 | 4,060 | 33,100 |
| Unfinished titanium dioxide ² | 1,460 | 7,160 | 1,230 | 777 | 1,590 | 971 | 4,570 |

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

²Unmixed and not surface treated.

Source: U.S. Census Bureau.

TABLE 3
U.S. IMPORTS FOR CONSUMPTION OF TITANIUM METAL¹

(Metric tons)

| | 2011 | | 2012 | | | | 1st quarter– 4th quarter |
|---|------------------|-----------------------------|--------------|--------------|--------------|--------------|-----------------------------|
| | 4th quarter | 1st quarter– 4th quarter | 1st quarter | 2d quarter | 3d quarter | 4th quarter | |
| Waste and scrap: | | | | | | | |
| Canada | 240 | 738 | 206 | 206 | 156 | 189 | 757 |
| France | 469 | 1,790 | 490 | 540 | 400 | 516 | 1,950 |
| Germany | 498 | 1,930 | 649 | 557 | 598 | 458 | 2,260 |
| Israel | 101 | 523 | 102 | 115 | 109 | 85 | 410 |
| Italy | 77 | 329 | 121 | 94 | 12 | 74 | 301 |
| Japan | 642 | 2,260 | 607 | 554 | 479 | 402 | 2,040 |
| Korea, Republic of | 185 | 655 | 133 | 313 | 140 | 19 | 605 |
| Mexico | 96 | 369 | 104 | 137 | 150 | 150 | 541 |
| Singapore | 57 | 179 | 65 | 24 | 46 | 57 | 192 |
| Sweden | -- | -- | 138 | 36 | 93 | 48 | 314 |
| Taiwan | 144 | 813 | 136 | 101 | 98 | 47 | 383 |
| United Kingdom | 918 | 2,820 | 915 | 967 | 855 | 799 | 3,540 |
| Other | 457 ^r | 1,520 | 337 | 305 | 305 | 207 | 1,150 |
| Total | 3,880 | 13,900 | 4,000 | 3,950 | 3,440 | 3,050 | 14,400 |
| Unwrought: | | | | | | | |
| Sponge: | | | | | | | |
| China | 2,210 | 5,860 | 1,470 | 892 | 908 | 238 | 3,510 |
| Japan | 4,620 | 16,100 | 4,370 | 4,930 | 5,130 | 4,510 | 18,900 |
| Kazakhstan ^e | 2,000 | 8,610 | 2,420 | 2,150 | 2,060 | 1,410 | 8,030 |
| Ukraine | 775 | 1,950 | 440 | 434 | 307 | 291 | 1,470 |
| Other ² | 363 | 1,270 | 199 | 663 | 469 | 347 | 1,680 |
| Total | 9,960 | 33,800 | 8,900 | 9,060 | 8,870 | 6,800 | 33,600 |
| Ingot: | | | | | | | |
| Germany | 98 | 344 | 59 | 30 | 20 | -- | 109 |
| Russia | 141 | 302 | 162 | 117 | 35 | 87 | 401 |
| Other | -- | 9 | -- | -- | -- | -- | -- |
| Total | 239 | 655 | 221 | 147 | 55 | 87 | 510 |
| Powder | | | | | | | |
| Other | 86 | 208 | 186 | 114 | 48 | 101 | 448 |
| Wrought: | | | | | | | |
| Bar, rod, profiles, wire | 385 | 1,710 | 505 | 500 | 374 | 367 | 1,750 |
| Billet | 186 | 885 | 256 | 257 | 282 | 220 | 1,010 |
| Bloom, sheet bar, slab | 11 | 30 | 4 | 15 | 1 | 2 | 21 |
| Plate, sheet, strip, foil | 591 | 2,910 | 751 | 647 | 742 | 716 | 2,860 |
| Tube and pipe | 124 | 440 | 92 | 83 | 42 | 89 | 303 |
| Other | 67 | 218 | 42 | 140 | 100 | 137 | 420 |
| Total | 1,360 | 6,190 | 1,650 | 1,640 | 1,540 | 1,530 | 6,360 |
| Other articles of titanium: | | | | | | | |
| Castings | 3 | 51 | 5 | 7 | 6 | 19 | 36 |
| Other | 101 | 574 | 136 | 155 | 83 | 72 | 446 |
| Ferrotitanium and ferrosilicon titanium | 419 | 2,070 | 660 | 767 | 505 | 483 | 2,410 |

^eEstimated. -- Zero.

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

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

Source: U.S. Census Bureau.

TABLE 4
U.S. IMPORTS FOR CONSUMPTION OF TITANIUM CONCENTRATES¹

(Metric tons)

| | 2011 | | 2012 | | | | 1st quarter– 4th quarter |
|--|----------------|-----------------------------|----------------|----------------|----------------|----------------|-----------------------------|
| | 4th quarter | 1st quarter– 4th quarter | 1st quarter | 2d quarter | 3d quarter | 4th quarter | |
| Ilmenite: | | | | | | | |
| Australia | 55,600 | 244,000 | 99,000 | 38,200 | 62,300 | 45,000 | 245,000 |
| Mozambique | 31,000 | 114,000 | 32,800 | 20,000 | 25,000 | 22,000 | 99,800 |
| Ukraine | -- | 10,000 | -- | 9,970 | -- | -- | 9,970 |
| Other ² | -- | 9,340 | 9,750 | -- | -- | 9,640 | 19,400 |
| Total | 86,600 | 377,000 | 142,000 | 68,200 | 87,300 | 76,600 | 374,000 |
| Titanium slag: | | | | | | | |
| Canada | 81,100 | 191,000 | 77,100 | 59,000 | 101,000 | 65,100 | 303,000 |
| South Africa | 93,900 | 323,000 | 98,500 | 83,100 | 25,400 | 108,000 | 315,000 |
| Other ² | -- | -- | -- | 1 | -- | -- | 1 |
| Total | 175,000 | 513,000 | 176,000 | 142,000 | 127,000 | 173,000 | 618,000 |
| Rutile: | | | | | | | |
| Australia | 16,100 | 106,000 | 49,500 | 22,700 | 33,600 | 25,400 | 131,000 |
| South Africa | 39,000 | 133,000 | 24,700 | 41,600 | 30,500 | 38,600 | 135,000 |
| Other ² | 13,900 | 23,600 | 540 | 5,030 | 4,610 | 40 | 10,200 |
| Total | 69,000 | 262,000 | 74,800 | 69,300 | 68,700 | 64,000 | 277,000 |
| Synthetic rutile: | | | | | | | |
| Australia | 16,000 | 112,000 | 40,100 | 10,200 | 35,000 | 22,000 | 107,000 |
| Other ² | 4,900 | 6,960 | 3,040 | 199 | 434 | 704 | 4,380 |
| Total | 20,900 | 119,000 | 43,200 | 10,400 | 35,500 | 22,700 | 112,000 |
| Titaniferous iron ore, Canada ² | 33 | 96 | 184 | -- | -- | 102 | 286 |

-- Zero.

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

²All 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 PIGMENT¹

(Metric tons)

| | 2011 | | 2012 | | | | |
|---|-------------|-----------------------------|-------------|------------|------------|-------------|-----------------------------|
| | 4th quarter | 1st quarter– 4th quarter | 1st quarter | 2d quarter | 3d quarter | 4th quarter | 1st quarter– 4th quarter |
| 80% or more titanium dioxide: | | | | | | | |
| Canada | 16,600 | 79,000 | 20,900 | 20,200 | 16,500 | 10,700 | 68,300 |
| China | 2,670 | 10,300 | 4,300 | 7,880 | 8,200 | 4,910 | 25,300 |
| Finland | 1,790 | 6,790 | 1,130 | 1,210 | 2,220 | 1,440 | 5,990 |
| France | 1,320 | 4,910 | 1,660 | 1,240 | 1,460 | 742 | 5,110 |
| Germany | 1,730 | 6,450 | 1,300 | 1,870 | 4,570 | 643 | 8,380 |
| Italy | 850 | 3,460 | 836 | 760 | 491 | 533 | 2,620 |
| Japan | 997 | 4,180 | 899 | 1,000 | 1,130 | 1,190 | 4,220 |
| Spain | -- | -- | 519 | 830 | 1,230 | 564 | 3,140 |
| Ukraine | 2,270 | 11,700 | 2,850 | 4,030 | 3,270 | 912 | 11,100 |
| Other | 2,890 | 13,700 | 2,090 | 3,860 | 6,580 | 3,930 | 16,500 |
| Total | 31,100 | 140,000 | 36,500 | 42,900 | 45,700 | 25,500 | 151,000 |
| Other titanium dioxide: | | | | | | | |
| Canada | 2,170 | 8,820 | 2,280 | 2,110 | 2,180 | 1,630 | 8,190 |
| China | 378 | 1,110 | 306 | 447 | 679 | 322 | 1,750 |
| France | -- | -- | 83 | 259 | 2 | 82 | 427 |
| Germany | 33 | 666 | 150 | 185 | 156 | 165 | 656 |
| Japan | 52 | 552 | 178 | 281 | 276 | 54 | 789 |
| Other | 241 | 1,030 | 273 | 391 | 381 | 270 | 1,320 |
| Total | 2,880 | 12,200 | 3,270 | 3,680 | 3,670 | 2,520 | 13,100 |
| Unfinished titanium dioxide:² | | | | | | | |
| China | 5,710 | 24,200 | 4,400 | 4,610 | 3,230 | 3,590 | 15,800 |
| Czech Republic | 516 | 2,460 | 588 | 753 | 668 | 609 | 2,620 |
| Finland | 789 | 2,910 | 576 | 552 | 440 | 881 | 2,450 |
| France | 1,560 | 5,720 | 1,200 | 370 | 281 | 908 | 2,760 |
| Germany | 770 | 4,270 | 824 | 1,080 | 784 | 651 | 3,340 |
| Italy | 268 | 3,120 | 669 | 1,040 | 865 | 154 | 2,730 |
| Korea, Republic of | 436 | 2,630 | 657 | 1,310 | 1,340 | 1,190 | 4,490 |
| Other | 671 | 2,430 | 1,470 | 1,190 | 593 | 1,300 | 4,560 |
| Total | 10,700 | 47,700 | 10,400 | 10,900 | 8,200 | 9,290 | 38,800 |
| Grand total | 44,700 | 200,000 | 50,200 | 57,500 | 57,500 | 37,400 | 203,000 |

-- Zero.

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

²Unmixed and not surface treated.

Source: U.S. Census Bureau.

TABLE 6
PRICES FOR TITANIUM MATERIALS

(End of period)

| | | 2011 | 2012 | | | |
|--|-----------------------------------|------------------|-------------|-------------|------------------|-------------|
| | | | 1st quarter | 2d quarter | 3d quarter | 4th quarter |
| Concentrate: | | | | | | |
| Ilmenite, f.o.b. Australian ports ¹ | dollars per metric ton | 140–250 | 250–350 | 250–350 | 250–350 | 250–350 |
| Titanium slag, import ² | do. | 468–494 | 682–948 | 708–1,022 | 532–981 | 512–763 |
| Rutile, natural:¹ | | | | | | |
| Bagged, f.o.b. Australian ports | do. | 1,348–1,600 | 2,480–2,700 | 2,500–2,800 | 2,500–2,800 | 2,500–2,800 |
| Bulk, f.o.b. Australian ports | do. | 1,300–1,400 | 1,990–2,050 | 2,050–2,400 | 2,050–2,400 | 2,050–2,400 |
| Metal: | | | | | | |
| Sponge metal, Japan, import ² | dollars per pound | 5.74 | 6.84 | 6.81 | 6.87 | 6.73 |
| Titanium mill products | producer price index ³ | 208 ^r | 200 | 184 | 184 ^r | 187 |
| Titanium scrap, turnings, unprocessed (Ti-6Al-4V) ⁴ | dollars per pound | 2.00–2.20 | 2.15–2.30 | 2.00–2.10 | 1.80–1.90 | 1.70–1.75 |
| Ferrotitanium, 70% (max. 4.5% Al) per pound Ti ⁴ | do. | 3.45–3.55 | 3.60–3.65 | 3.50–3.55 | 3.25–3.35 | 3.20–3.25 |
| Pigment: | | | | | | |
| Titanium dioxide pigment, import ² | dollars per metric ton | 3,530 | 3,670 | 3,780 | 3,530 | 3,414 |
| Titanium dioxide pigment | producer price index ³ | 271 ^r | 291 | 303 | 293 ^r | 273 |

^rRevised. do. Ditto.

¹Source: Industrial Minerals (London).

²Unit value based on landed-duty-paid U.S. imports for consumption.

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

⁴Source: Platts Metals Week.