

# Mineral Industry Surveys

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## TUNGSTEN IN JANUARY 2000

January 2000 U.S. net production of intermediate tungsten products, including metal powder and tungsten carbide powder produced from hydrogen-reduced metal powder, was 6% higher than that of December 1999, according to the U.S. Geological Survey.

Total U.S. reported consumption of ferrotungsten, tungsten metal powder, tungsten carbide powder, tungsten scrap, and other tungsten materials in January 2000 was approximately the same as that during December 1999. These materials were used to make alloys, cemented carbides, mill products, catalysts, and pigments.

Data for U.S. imports and exports for January 2000 will be published in a subsequent issue.

### Note

All data in this report have been rounded to no more than three

significant digits. Totals and percentages were calculated by using unrounded data.

### Update

Prices for tungsten ore concentrates in dollars per metric ton unit from Metal Bulletin are listed below. Prices in dollars per short ton unit were converted from metric ton unit prices and rounded to the nearest dollar. These prices represent combined prices for wolframite and scheelite ore concentrates with a minimum tungsten trioxide ( $\text{WO}_3$ ) content of 65%. The prices for February 1 to 29, 2000, are as follows:

Low—\$38/metric ton unit  $\text{WO}_3$  (\$34/short ton unit  $\text{WO}_3$ )  
High—\$48/metric ton unit  $\text{WO}_3$  (\$44/short ton unit  $\text{WO}_3$ )

TABLE 1  
U.S. SALIENT TUNGSTEN STATISTICS 1/

(Metric tons, tungsten content)

| Period              | Concentrate                  |                               |                       |                         | Reported<br>scrap<br>consumption | Intermediate products |                                 |                       |                         |
|---------------------|------------------------------|-------------------------------|-----------------------|-------------------------|----------------------------------|-----------------------|---------------------------------|-----------------------|-------------------------|
|                     | Reported<br>consump-<br>tion | Imports<br>for<br>consumption | Stocks, end of period |                         |                                  | Net<br>production 4/  | Reported<br>consump-<br>tion 5/ | Stocks, end of period |                         |
|                     |                              |                               | Industry 2/           | U.S. Gov-<br>ernment 3/ |                                  |                       |                                 | Industry 6/           | U.S. Gov-<br>ernment 3/ |
| 1999: p/            |                              |                               |                       |                         |                                  |                       |                                 |                       |                         |
| January             | W                            | 129                           | 589                   | 34,600                  | 278                              | 812                   | 671                             | 1,420                 | 2,700                   |
| February            | W                            | 156                           | W                     | 34,600                  | 307                              | 711                   | 699                             | 1,430                 | 2,700                   |
| March               | W                            | 714                           | 308                   | 34,600                  | 343                              | 816                   | 669                             | 1,490                 | 2,700                   |
| April               | 348                          | 90                            | W                     | 34,600                  | 302                              | 767                   | 630                             | 1,390                 | 2,700                   |
| May                 | 388                          | 383                           | W                     | 34,600                  | 306                              | 832                   | 647                             | 1,470                 | 2,700                   |
| June                | 313                          | 662                           | W                     | 34,600                  | 305                              | 784                   | 596                             | 1,440                 | 2,700                   |
| July                | 333                          | 232                           | 531                   | 34,600                  | 228                              | 721                   | 646                             | 1,430                 | 2,700                   |
| August              | 323                          | 145                           | 513                   | 34,600                  | 294                              | 829                   | 667                             | 1,420                 | 2,700                   |
| September           | 395                          | 94                            | W                     | 34,600                  | 256                              | 936                   | 702                             | 1,350                 | 2,700                   |
| October             | W                            | 133                           | W                     | 34,600                  | 335                              | 957                   | 678                             | 1,460                 | 2,700                   |
| November            | W                            | 71                            | W                     | 34,600                  | 243 r/                           | 701 r/                | 656 r/                          | 1,480 r/              | 2,700                   |
| December            | W                            | 66                            | W                     | 34,600                  | 260 r/                           | 696 r/                | 664 r/                          | 1,460 r/              | 2,700                   |
| January-December 7/ | 2,100                        | 2,870                         | XX                    | XX                      | 3,460 r/                         | 9,560 r/              | 7,920 r/                        | XX                    | XX                      |
| 2000:               |                              |                               |                       |                         |                                  |                       |                                 |                       |                         |
| January             | W                            | NA                            | W                     | 34,600                  | 257                              | 735                   | 671                             | 1,460                 | 2,700                   |

p/ Preliminary. r/ Revised. NA Not available. W Withheld to avoid disclosing company proprietary data; not included in total. XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Reported by consumers.

3/ Defense National Stockpile Center. Includes material committed for sale pending shipment.

4/ Net production of tungsten metal powder, tungsten carbide powder, chemicals, and other products.

5/ Includes estimates and scrap.

6/ Reported by producers.

7/ Does not include withheld data.

TABLE 2  
U.S. PRODUCTION, CONSUMPTION, AND STOCKS OF  
AMMONIUM PARATUNGSTATE, BY MONTH 1/

(Metric tons, tungsten content)

| Period    | Production | Consumption | Stocks,<br>end of<br>period 2/ |
|-----------|------------|-------------|--------------------------------|
| 1999: p/  |            |             |                                |
| January   | W          | 536         | 582                            |
| February  | W          | 474         | 512                            |
| March     | W          | 831         | 542                            |
| April     | W          | 701         | 476                            |
| May       | W          | 739         | 496                            |
| June      | W          | W           | 648                            |
| July      | W          | 821         | 503                            |
| August    | W          | 723         | 505                            |
| September | W          | 726         | 448                            |
| October   | W          | 870         | 496                            |
| November  | W          | 770         | 431                            |
| December  | W          | W           | W                              |
| Total 3/  | W          | 7,190       | XX                             |
| 2000:     |            |             |                                |
| January   | W          | 744         | W                              |

p/ Preliminary. r/ Revised. W Withheld to avoid disclosing company proprietary data; not included in total. XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Producers and consumers.

3/ Does not include withheld data.

TABLE 3  
U.S. PRODUCTION AND STOCKS OF TUNGSTEN PRODUCTS 1/

(Metric tons, tungsten content)

| Product   | Net production 2/ |         |              | Stocks at end of period |         |
|---|-------------------|---------|--------------|-------------------------|---------|
|   | 2000              |         |              | 2000                    |         |
|   | 1999 p/           | January | Year to date | 1999 p/                 | January |
| Metal powder  | 4,640 r/          | 356     | 356          | 777 r/                  | 778     |
| Tungsten carbide powder<br>(made from metal powder) | 4,930 r/          | 379     | 379          | 555 r/                  | 554     |
| Cast and crystalline<br>carbide powder; other       | W                 | W       | W            | W                       | W       |
| Chemicals   | W                 | W       | W            | 128 r/                  | 130     |
| Total 3/  | 9,560 r/          | 735     | 735          | 1,460 r/                | 1,460   |

p/ Preliminary. r/ Revised. W Withheld to avoid disclosing company proprietary data; not included in total.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Gross production less quantity used to make other products in table.

3/ Does not include withheld data.

TABLE 4  
U.S. REPORTED CONSUMPTION OF TUNGSTEN, BY END USE 1/ 2/ 3/

(Metric tons, tungsten content)

| End use   | 1999 p/  |              | 2000    |
|---|----------|--------------|---------|
|   | December | Year to date | January |
| Steel   | W        | W            | 51      |
| Superalloys                                       | 33       | 372          | 35      |
| Other alloys (excludes steels and superalloys) 4/ | W        | W            | W       |
| Cemented carbides 5/                              | 446 r/   | 5,380 r/     | 446     |
| Mill products made from metal powder              | 75       | 1,290        | 82      |
| Chemical uses                                     | W        | W            | W       |
| Miscellaneous and unspecified                     | 109 r/   | 884 r/       | 57      |
| Total   | 664 r/   | 7,920        | 671     |

p/ Preliminary. r/ Revised. W Withheld to avoid disclosing company proprietary data; included with "miscellaneous and unspecified."

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Does not include materials used in making primary tungsten products.

3/ Includes estimates.

4/ Includes welding and hard-facing rods and materials, wear- and corrosion-resistant alloys, and nonferrous alloys.

5/ Includes diamond bit matrices, cemented and sintered carbides, and cast carbide dies or parts.

TABLE 5  
U.S. REPORTED CONSUMPTION AND CONSUMER STOCKS OF TUNGSTEN MATERIALS 1/ 2/ 3/

(Metric tons, tungsten content)

| Period           | Ferro-tungsten | Tungsten metal powder | Tungsten carbide powder | Tungsten scrap | Other tungsten materials 4/ | Total    |
|------------------|----------------|-----------------------|-------------------------|----------------|-----------------------------|----------|
| Consumption:     |                |                       |                         |                |                             |          |
| 1999: p/         |                |                       |                         |                |                             |          |
| January          | 43             | 95                    | 490                     | 34             | 10                          | 671      |
| February         | 43             | 122                   | 491                     | 33             | 9                           | 699      |
| March            | 45             | 98                    | 488                     | 30             | 9                           | 669      |
| April            | 43             | 121                   | 432                     | 25             | 9                           | 630      |
| May              | 45             | 141                   | 422                     | 30             | 9                           | 647      |
| June             | 41             | 102                   | 419                     | 25             | 10                          | 596      |
| July             | 41             | 111                   | 456                     | 28             | 10                          | 646      |
| August           | 41             | 145                   | 449                     | 21             | 10                          | 667      |
| September        | 57             | 170                   | 445                     | 21             | 9                           | 702      |
| October          | 47             | 117                   | 483                     | 22             | 9                           | 678      |
| November         | 44             | 88                    | 487 r/                  | 26             | 11                          | 656 r/   |
| December         | 48             | 82                    | 494 r/                  | 29             | 12                          | 664 r/   |
| January-December | 538            | 1,390                 | 5,560 r/                | 324            | 115                         | 7,920 r/ |
| 2000:            |                |                       |                         |                |                             |          |
| January          | 47             | 88                    | 498                     | 30             | 8                           | 671      |
| Stocks:          |                |                       |                         |                |                             |          |
| 1999: p/         |                |                       |                         |                |                             |          |
| January          | 29             | 25                    | 416                     | 28             | 17                          | 514      |
| February         | 25             | 22                    | 403                     | 32             | 16                          | 498      |
| March            | 27             | 26                    | 419                     | 26             | 17                          | 515      |
| April            | 26             | 24                    | 410                     | 20             | 17                          | 497      |
| May              | 27             | 19                    | 406                     | 20             | 18                          | 490      |
| June             | 33             | 18                    | 404                     | 20             | 20                          | 494      |
| July             | 31             | 20                    | 414                     | 18             | 18                          | 502      |
| August           | 36             | 22                    | 401                     | 24             | 17                          | 499      |
| September        | 22             | 19                    | 399                     | 23             | 17                          | 480      |
| October          | 27             | 22                    | 397                     | 28             | 16                          | 489      |
| November         | 25             | 24                    | 398 r/                  | 22 r/          | 18                          | 486 r/   |
| December         | 32             | 19                    | 401 r/                  | 18             | 18                          | 487 r/   |
| 2000:            |                |                       |                         |                |                             |          |
| January          | 33             | 22                    | 400                     | 18             | 18                          | 490      |

p/ Preliminary. r/ Revised.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Does not include materials used in making primary tungsten products.

3/ Includes estimates.

4/ Includes tungsten chemicals.

TABLE 6  
U.S. IMPORTS FOR CONSUMPTION OF TUNGSTEN, BY COUNTRY 1/

(Metric tons, tungsten content)

| Period and country of origin | Ores and concentrates | Ammonium tungstates | Ferro-tungsten | Metal powder | Tungsten carbide powder | Other 2/ | Total  | Total year to date |
|------------------------------|-----------------------|---------------------|----------------|--------------|-------------------------|----------|--------|--------------------|
| 1998                         | 4,750                 | 1,920               | 599            | 459          | 944                     | 3,110    | 11,800 | XX                 |
| 1999:                        |                       |                     |                |              |                         |          |        |                    |
| October                      | 133                   | 113                 | 14             | 58           | 77                      | 233      | 628    | 8,690              |
| November                     | 71                    | 84                  | 44             | 19           | 45                      | 249      | 512    | 9,200              |
| December:                    |                       |                     |                |              |                         |          |        |                    |
| Australia                    | --                    | --                  | --             | --           | --                      | --       | --     | 167                |
| Austria                      | --                    | --                  | --             | --           | 17                      | 1        | 19     | 63                 |
| Belgium                      | --                    | --                  | --             | (3/)         | --                      | --       | (3/)   | 3                  |
| Bolivia                      | 14                    | --                  | --             | --           | --                      | --       | 14     | 361                |
| Burma                        | --                    | --                  | --             | --           | --                      | --       | --     | 91                 |
| Canada                       | --                    | --                  | --             | (3/)         | 44                      | 5        | 49     | 441                |
| China                        | --                    | 36                  | 42             | 1            | 16                      | 69       | 163    | 4,830              |
| Czech Republic               | --                    | --                  | --             | --           | --                      | --       | --     | (3/)               |
| Estonia                      | --                    | --                  | --             | --           | --                      | --       | --     | (3/)               |
| France                       | --                    | --                  | --             | --           | --                      | --       | --     | 2                  |
| Germany                      | --                    | 18                  | 1              | 3            | 9                       | 6        | 37     | 306                |
| Hong Kong                    | --                    | --                  | --             | --           | --                      | --       | --     | 1                  |
| Hungary                      | --                    | --                  | --             | --           | --                      | 1        | 1      | 11                 |
| India                        | --                    | --                  | --             | --           | --                      | --       | --     | (3/)               |
| Ireland                      | --                    | --                  | --             | --           | --                      | --       | --     | (3/)               |
| Israel                       | --                    | --                  | --             | 4            | 16                      | (3/)     | 20     | 95                 |
| Italy                        | --                    | --                  | --             | --           | --                      | (3/)     | (3/)   | (3/)               |
| Japan                        | --                    | --                  | --             | 1            | --                      | 2        | 3      | 47                 |
| Kazakhstan                   | --                    | --                  | --             | --           | --                      | --       | --     | 461                |
| Korea, Republic of           | --                    | --                  | --             | --           | --                      | (3/)     | (3/)   | 10                 |
| Luxembourg                   | --                    | --                  | --             | --           | --                      | --       | --     | 34                 |
| Malaysia                     | --                    | --                  | --             | --           | --                      | --       | --     | (3/)               |
| Mexico                       | --                    | --                  | --             | --           | --                      | (3/)     | (3/)   | 27                 |
| Mongolia                     | 16                    | --                  | --             | --           | --                      | --       | 16     | 55                 |
| Netherlands                  | --                    | --                  | --             | --           | --                      | (3/)     | (3/)   | 37                 |
| Peru                         | 11                    | --                  | --             | --           | --                      | --       | 11     | 22                 |
| Portugal                     | 12                    | --                  | --             | --           | --                      | --       | 12     | 353                |
| Russia                       | --                    | --                  | 44             | --           | 1                       | 56       | 101    | 1,960              |
| Rwanda                       | 14                    | --                  | --             | --           | --                      | --       | 14     | 55                 |
| Singapore                    | --                    | --                  | --             | --           | --                      | (3/)     | (3/)   | (3/)               |
| South Africa                 | --                    | --                  | --             | --           | --                      | --       | --     | (3/)               |
| Spain                        | --                    | --                  | --             | --           | --                      | --       | --     | (3/)               |
| Sweden                       | --                    | --                  | --             | --           | --                      | --       | --     | 34                 |
| Switzerland                  | --                    | --                  | --             | --           | --                      | (3/)     | (3/)   | 3                  |
| Taiwan                       | --                    | --                  | --             | --           | --                      | --       | --     | (3/)               |
| Thailand                     | --                    | --                  | --             | --           | --                      | --       | --     | 11                 |
| United Kingdom               | --                    | --                  | --             | --           | --                      | 5        | 5      | 180                |
| Total                        | 66                    | 53                  | 86             | 9            | 103                     | 146      | 464    | 9,670              |
| Total, year to date          | 2,870                 | 1,920               | 669            | 310          | 790                     | 3,100    | 9,670  | XX                 |

XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes other unwrought tungsten, wrought tungsten, calcium and other tungstates, tungsten oxides, tungsten chlorides, other tungsten compounds, ash and residues containing mainly tungsten, and other mixtures of inorganic compounds containing tungsten. Tungsten content estimated in part.

3/ Less than 1/2 unit.

Note: Imports of waste and scrap in December 1999 totaled 75 metric tons, tungsten content.

Source: Bureau of the Census.

TABLE 7  
U.S. EXPORTS OF TUNGSTEN, BY COUNTRY 1/

(Metric tons, tungsten content)

| Period and country of destination | Ores and concentrates 2/ | Ammonium tungstates | Metal powder 2/ | Tungsten carbide powder | Other 3/ | Total | Total year to date |
|-----------------------------------|--------------------------|---------------------|-----------------|-------------------------|----------|-------|--------------------|
| 1998                              | 10                       | 287                 | 851             | 1,240                   | 467      | 2,860 | XX                 |
| 1999:                             |                          |                     |                 |                         |          |       |                    |
| October                           | --                       | --                  | 36              | 59                      | 37       | 132   | 1,760              |
| November                          | (4/)                     | --                  | 42              | 40                      | 41       | 123   | 1,880              |
| December:                         |                          |                     |                 |                         |          |       |                    |
| Argentina                         | --                       | --                  | --              | --                      | --       | --    | 3                  |
| Australia                         | --                       | --                  | --              | (4/)                    | 1        | 1     | 22                 |
| Austria                           | --                       | --                  | (4/)            | --                      | --       | (4/)  | 21                 |
| Belgium                           | --                       | --                  | --              | 1                       | (4/)     | 2     | 153                |
| Brazil                            | (4/)                     | --                  | (4/)            | (4/)                    | 1        | 2     | 41                 |
| Canada                            | --                       | --                  | 2               | 21                      | 4        | 27    | 265                |
| Chile                             | --                       | --                  | (4/)            | --                      | (4/)     | (4/)  | 4                  |
| China                             | --                       | --                  | --              | --                      | (4/)     | (4/)  | 4                  |
| Congo (Kinshasa)                  | --                       | --                  | --              | --                      | --       | --    | 8                  |
| Czech Republic                    | --                       | --                  | --              | --                      | --       | --    | 5                  |
| Denmark                           | --                       | --                  | --              | --                      | --       | --    | 7                  |
| El Salvador                       | --                       | --                  | --              | --                      | (4/)     | (4/)  | (4/)               |
| Finland                           | --                       | --                  | --              | --                      | --       | --    | 1                  |
| France                            | --                       | --                  | 1               | --                      | 1        | 2     | 61                 |
| Germany                           | --                       | --                  | 14              | 10                      | 21       | 44    | 569                |
| Hong Kong                         | --                       | --                  | (4/)            | --                      | (4/)     | (4/)  | 31                 |
| Hungary                           | --                       | --                  | (4/)            | --                      | 5        | 5     | 17                 |
| India                             | --                       | --                  | --              | (4/)                    | 4        | 4     | 122                |
| Indonesia                         | --                       | --                  | --              | --                      | --       | --    | 2                  |
| Ireland                           | (4/)                     | --                  | --              | 1                       | (4/)     | 2     | 11                 |
| Israel                            | --                       | --                  | 13              | 5                       | 1        | 19    | 65                 |
| Italy                             | --                       | --                  | 1               | 4                       | (4/)     | 6     | 82                 |
| Japan                             | (4/)                     | 1                   | 1               | 1                       | 4        | 6     | 94                 |
| Korea, Republic of                | 1                        | --                  | --              | 1                       | (4/)     | 1     | 17                 |
| Kuwait                            | --                       | --                  | --              | --                      | (4/)     | (4/)  | (4/)               |
| Luxembourg                        | --                       | --                  | --              | --                      | --       | --    | 13                 |
| Malaysia                          | --                       | --                  | --              | --                      | (4/)     | (4/)  | 1                  |
| Mexico                            | --                       | --                  | (4/)            | --                      | 3        | 3     | 53                 |
| Netherlands                       | --                       | --                  | 11              | 4                       | (4/)     | 15    | 92                 |
| New Zealand                       | --                       | --                  | --              | --                      | (4/)     | (4/)  | (4/)               |
| Philippines                       | --                       | --                  | --              | --                      | 1        | 1     | 1                  |
| Poland                            | --                       | --                  | --              | --                      | --       | --    | 3                  |
| Singapore                         | (4/)                     | --                  | 1               | (4/)                    | (4/)     | 1     | 8                  |
| South Africa                      | --                       | --                  | --              | 2                       | --       | 2     | 24                 |
| Spain                             | --                       | (4/)                | (4/)            | --                      | --       | (4/)  | 8                  |
| Sweden                            | --                       | --                  | (4/)            | --                      | --       | (4/)  | 82                 |
| Switzerland                       | --                       | --                  | --              | 2                       | (4/)     | 2     | 27                 |
| Taiwan                            | --                       | --                  | 1               | (4/)                    | (4/)     | 1     | 22                 |
| Thailand                          | --                       | --                  | --              | --                      | --       | --    | 1                  |
| Turkey                            | --                       | --                  | (4/)            | (4/)                    | --       | (4/)  | 1                  |
| United Arab Emirates              | --                       | --                  | (4/)            | --                      | (4/)     | (4/)  | 1                  |
| United Kingdom                    | --                       | --                  | 3               | 1                       | 1        | 5     | 90                 |
| Venezuela                         | --                       | --                  | --              | --                      | --       | --    | 3                  |
| Other                             | --                       | --                  | --              | --                      | --       | --    | 5                  |
| Total                             | 2                        | 1                   | 49              | 55                      | 47       | 153   | 2,040              |
| Total, year to date               | 26                       | 103                 | 711             | 701                     | 498      | 2,040 | XX                 |

XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Tungsten content estimated from reported gross weight.

3/ Includes wrought tungsten, ferrotungsten, and other tungstates. Tungsten content estimated in part.

4/ Less than 1/2 unit.

Note: Estimated exports of waste and scrap in December 1999 totaled 78 metric tons, tungsten content.

Source: Bureau of the Census.