

# Mineral Industry Surveys

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**For information, contact:**

Kim B. Shedd, Cobalt Commodity Specialist  
U.S. Geological Survey  
989 National Center  
Reston, VA 20192  
Telephone: (703) 648-4974, Fax: (703) 648-7757  
E-mail: ksheddd@usgs.gov

Jo-Ann Sterling (Data)  
Telephone: (703) 648-7953  
Fax: (703) 648-7975  
E-mail: jsterlin@usgs.gov

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

## COBALT IN JUNE 2004

On the basis of preliminary data, U.S. cobalt consumption during the quarter ending June 30, 2004, decreased 5% compared with consumption during the quarter ending March 31, 2004, according to the U.S. Geological Survey. U.S. cobalt consumption during the first half of 2004 was nearly equal in amount to that consumed during the first half of 2003.

The amount of cobalt contained in U.S. imports of cobalt metals and chemicals was 7% higher during January through May 2004 than that of imports during the same period in 2003. The amount of cobalt contained in U.S. exports of unwrought cobalt and chemicals was 18% higher during January through May 2004 than that of exports during the same period in 2003. Trade data for June 2004 will be available in a subsequent issue.

**Price**

Prices for electrolytic cobalt, in dollars per pound from Platts Metals Week, are listed below.

| <u>Date</u> | <u>Price range</u> |
|-------------|--------------------|
| July 15     | 24.50-25.00        |
| July 22     | 24.00-24.60        |
| July 29     | 23.75-24.25        |
| August 5    | 23.75-24.25        |

  

| <u>Month</u> | <u>Average price</u> |
|--------------|----------------------|
| July         | 24.76                |

TABLE 1  
U.S. REPORTED CONSUMPTION OF COBALT MATERIALS<sup>1</sup>

(Metric tons, contained cobalt)

| Period                        | Metal <sup>2</sup> | Oxide and other chemical compounds <sup>3</sup> | Scrap | Total            |
|-------------------------------|--------------------|---|-------|------------------|
| 2003:                         |                    |   |       |                  |
| June                          | 254                | 169   | 167   | 590              |
| July                          | 250                | 157   | 167   | 574              |
| August                        | 254                | 164   | 167   | 585              |
| September                     | 259                | 168   | 167   | 594              |
| October                       | 252                | 165   | 167   | 584              |
| November                      | 265                | 155   | 167   | 588              |
| December                      | 241                | 156   | 167   | 565              |
| January-June                  | 1,540              | 984   | 1,000 | 3,520            |
| January-December <sup>4</sup> | 3,060              | 1,950   | 2,010 | 7,010            |
| 2004:                         |                    |   |       |                  |
| January                       | 263                | 224   | 167   | 654              |
| February                      | 258                | 183   | 167   | 609              |
| March                         | 233                | 170   | 167   | 571              |
| April                         | 237                | 174   | 167   | 579 <sup>r</sup> |
| May                           | 237                | 161   | 167   | 566              |
| June                          | 240                | 184   | 167   | 592              |
| January-June                  | 1,470              | 1,100   | 1,000 | 3,570            |

<sup>r</sup>Revised.

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

<sup>2</sup>Includes metal powder.

<sup>3</sup>Data may include other cobalt materials.

<sup>4</sup>Data based on monthly reports.

TABLE 2  
U.S. REPORTED CONSUMPTION OF COBALT, BY END USE<sup>1</sup>

(Metric tons, contained cobalt)

| End use                                | 2003                      |                               | 2004 |                           |
|--|---------------------------|-------------------------------|------|---------------------------|
|  | January-June <sup>r</sup> | January-December <sup>2</sup> | June | January-June <sup>3</sup> |
| Steel                                  | 187                       | 366                           | 40   | 217                       |
| Superalloys                            | 1,590                     | 3,170                         | 243  | 1,500                     |
| Magnetic alloys                        | 192                       | 385                           | 27   | 169                       |
| Other alloys <sup>4</sup>              | W                         | W                             | W    | W                         |
| Cemented carbides <sup>5</sup>         | 336                       | 679                           | 58   | 351                       |
| Chemical and ceramic uses <sup>6</sup> | 1,080                     | 2,140                         | 201  | 1,200                     |
| Miscellaneous and unspecified          | 137                       | 272                           | 23   | 135                       |
| Total                                  | 3,520                     | 7,010                         | 592  | 3,570                     |

<sup>r</sup>Revised. W Withheld to avoid disclosing company proprietary data; included with "Miscellaneous and unspecified."

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

<sup>2</sup>Data based on monthly reports.

<sup>3</sup>May include revisions to prior months.

<sup>4</sup>Includes nonferrous alloys, welding materials, and wear-resistant alloys.

<sup>5</sup>Includes diamond tool matrices, cemented and sintered carbides, and cast carbide dies or parts.

<sup>6</sup>Includes catalysts, driers in paints or related usages, feed or nutritive additives, glass decolorizer, ground coat frit, pigments, and other uses.

TABLE 3  
U.S. REPORTED STOCKS OF COBALT MATERIALS<sup>1</sup>

(Metric tons, contained cobalt)

| Period                | Industry <sup>2</sup> |   |       | Total            | U.S.<br>Government,<br>metal <sup>5</sup> |
|-----------------------|-----------------------|---|-------|------------------|---|
|                       | Metal <sup>3</sup>    | Oxide and<br>other chemical<br>compounds <sup>4</sup> | Scrap |                  |   |
| 2003:                 |                       |   |       |                  |   |
| June                  | 366                   | 200   | 188   | 754              | 5,240                                     |
| July                  | 369                   | 216   | 188   | 773              | 5,040                                     |
| August                | 387                   | 206   | 188   | 781              | 4,990                                     |
| September             | 402                   | 206   | 188   | 795              | 4,930                                     |
| October               | 396                   | 203   | 188   | 787              | 4,750                                     |
| November              | 368                   | 203   | 188   | 759              | 4,640                                     |
| December <sup>6</sup> | 387                   | 204   | 188   | 779              | 4,290                                     |
| 2004:                 |                       |   |       |                  |   |
| January               | 358                   | 204   | 104   | 666              | 3,900                                     |
| February              | 325                   | 193   | 104   | 622              | 3,410                                     |
| March                 | 363                   | 218   | 104   | 685              | 3,120                                     |
| April                 | 338                   | 207   | 104   | 650              | 2,980                                     |
| May                   | 338                   | 202 <sup>r</sup>                                      | 104   | 644 <sup>r</sup> | 2,860                                     |
| June                  | 334                   | 202   | 104   | 640              | 2,800                                     |

<sup>r</sup>Revised.

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

<sup>2</sup>Stocks reported by cobalt processors and consumers.

<sup>3</sup>Includes metal powder.

<sup>4</sup>Data may include other cobalt materials.

<sup>5</sup>Data from Defense National Stockpile Center. Includes material committed for sale pending shipment.

<sup>6</sup>Data based on monthly reports.

TABLE 4  
U.S. IMPORTS FOR CONSUMPTION OF COBALT, BY COUNTRY<sup>1</sup>

(Kilograms, gross weight of material, except as noted)

| Period and country<br>of origin | Metals <sup>2</sup>  |                        | Oxides and hydroxides |                    | Salts and compounds <sup>3</sup> |                    | Total cobalt<br>content for<br>the month <sup>5</sup> | Cobalt<br>content,<br>year to<br>date <sup>5, 6</sup> |
|---------------------------------|----------------------|------------------------|-----------------------|--------------------|----------------------------------|--------------------|---|---|
|                                 | Quantity             | Value <sup>4</sup>     | Quantity              | Value <sup>4</sup> | Quantity                         | Value <sup>4</sup> |   |   |
| 2003:                           |                      |                        |                       |                    |                                  |                    |   |   |
| May                             | 546,000              | \$10,700,000           | 237,000               | \$4,210,000        | 127,000                          | \$764,000          | 755,000   | 3,410,000   |
| June                            | 454,000              | 9,210,000              | 108,000               | 1,960,000          | 133,000                          | 797,000            | 568,000   | 3,980,000   |
| July                            | 641,000              | 13,000,000             | 104,000               | 1,690,000          | 130,000                          | 824,000            | 752,000   | 4,730,000   |
| August                          | 390,000 <sup>7</sup> | 8,440,000 <sup>7</sup> | 59,100                | 963,000            | 70,700                           | 480,000            | 452,000   | 5,180,000   |
| September                       | 712,000              | 14,000,000             | 92,800                | 1,560,000          | 166,000                          | 1,160,000          | 831,000   | 6,010,000   |
| October                         | 526,000              | 11,100,000             | 100,000               | 1,660,000          | 152,000                          | 1,060,000          | 644,000   | 6,660,000   |
| November                        | 553,000              | 12,300,000             | 104,000               | 1,720,000          | 77,900                           | 488,000            | 651,000   | 7,310,000   |
| December                        | 632,000              | 16,300,000             | 131,000               | 2,540,000          | 121,000                          | 996,000            | 770,000   | 8,080,000   |
| January-May                     | 2,790,000            | 50,400,000             | 666,000               | 10,900,000         | 497,000                          | 2,540,000          | 3,410,000   | XX  |
| January-December                | 6,700,000            | 135,000,000            | 1,370,000             | 23,000,000         | 1,350,000                        | 8,350,000          | 8,080,000   | XX  |
| 2004:                           |                      |                        |                       |                    |                                  |                    |   |   |
| January                         | 525,000              | 17,100,000             | 131,000               | 2,710,000          | 172,000                          | 1,620,000          | 677,000   | 677,000   |
| February                        | 862,000              | 25,400,000             | 139,000               | 3,940,000          | 178,000                          | 2,380,000          | 1,020,000   | 1,700,000   |
| March                           | 680,000              | 29,900,000             | 126,000               | 4,290,000          | 119,000                          | 1,030,000          | 804,000   | 2,500,000   |
| April                           | 591,000              | 28,000,000             | 81,100                | 2,630,000          | 130,000                          | 1,910,000          | 690,000   | 3,190,000   |
| May:                            |                      |                        |                       |                    |                                  |                    |   |   |
| Australia                       | 20,000               | 1,100,000              | --                    | --                 | --                               | --                 | 20,000  | 175,000   |
| Belgium                         | 13,700               | 538,000                | 23,200                | 1,030,000          | --                               | --                 | 30,300  | 352,000   |
| Brazil                          | --                   | --                     | --                    | --                 | --                               | --                 | --  | 6,360   |
| Canada                          | 37,100               | 1,750,000              | --                    | --                 | --                               | --                 | 37,100  | 660,000   |
| China                           | 90,400               | 4,080,000              | --                    | --                 | 2,000                            | 21,400             | 90,900  | 347,000   |
| Colombia                        | --                   | --                     | --                    | --                 | --                               | --                 | --  | 518   |
| Finland                         | 25,400               | 1,600,000              | 13,300                | 539,000            | 22,300                           | 442,000            | 43,700  | 396,000   |
| France                          | 2,760                | 261,000                | 3,600                 | 186,000            | --                               | --                 | 5,360   | 39,200  |
| Germany                         | 1,080                | 66,600                 | --                    | --                 | --                               | --                 | 1,080   | 18,300  |
| India                           | --                   | --                     | --                    | --                 | --                               | --                 | --  | 26,800  |
| Italy                           | --                   | --                     | --                    | --                 | --                               | --                 | --  | 387   |
| Japan                           | --                   | --                     | --                    | --                 | 6,730                            | 81,500             | 1,680   | 60,900  |
| Korea, Republic of              | 200                  | 10,500                 | --                    | --                 | --                               | --                 | 200   | 6,030   |
| Netherlands                     | --                   | --                     | --                    | --                 | --                               | --                 | --  | 14  |
| Norway                          | 45,900               | 2,610,000              | --                    | --                 | --                               | --                 | 45,900  | 602,000   |
| Philippines                     | --                   | --                     | --                    | --                 | 5,550                            | 32,300             | 1,730   | 4,730   |
| Russia                          | 107,000              | 5,950,000              | --                    | --                 | --                               | --                 | 107,000   | 643,000   |
| South Africa                    | 26,200               | 527,000                | --                    | --                 | --                               | --                 | 26,200  | 85,200  |
| Spain                           | --                   | --                     | --                    | --                 | --                               | --                 | --  | 1,120   |
| Sweden                          | --                   | --                     | --                    | --                 | --                               | --                 | --  | 3,370   |
| Switzerland                     | --                   | --                     | --                    | --                 | --                               | --                 | --  | 4,640   |
| Taiwan                          | --                   | --                     | --                    | --                 | --                               | --                 | --  | 850   |
| United Kingdom                  | 1,050                | 59,900                 | --                    | --                 | 2,270                            | 35,600             | 2,090   | 44,100  |
| Zambia                          | 33,400               | 1,740,000              | --                    | --                 | --                               | --                 | 33,400  | 158,000   |
| Total                           | 404,000              | 20,300,000             | 40,100                | 1,760,000          | 38,900                           | 613,000            | 446,000   | 3,640,000   |
| January-May                     | 3,060,000            | 121,000,000            | 517,000               | 15,300,000         | 638,000                          | 7,560,000          | 3,640,000   | XX  |

XX Not applicable. -- Zero.

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

<sup>2</sup>Unwrought cobalt, excluding alloys; includes cobalt cathode and cobalt metal powder; may include intermediate products of cobalt metallurgy.

<sup>3</sup>Includes cobalt acetates, cobalt carbonates, cobalt chlorides, and cobalt sulfates.

<sup>4</sup>Customs value.

<sup>5</sup>Estimated from gross weights.

<sup>6</sup>May include revisions to prior months.

<sup>7</sup>All or part of these data have been referred to the U.S. Census Bureau for verification.

Source: U.S. Census Bureau, with adjustments by the U.S. Geological Survey.

TABLE 5  
U.S. IMPORTS FOR CONSUMPTION OF ADDITIONAL COBALT MATERIALS, BY COUNTRY <sup>1</sup>

(Kilograms, gross weight of material, except as noted)

| Period and country<br>of origin | Unwrought<br>cobalt alloys |                    | Cobalt waste and scrap |                    | Wrought cobalt and<br>cobalt articles |                    |
|---------------------------------|----------------------------|--------------------|------------------------|--------------------|---------------------------------------|--------------------|
|                                 | Quantity                   | Value <sup>2</sup> | Quantity               | Value <sup>2</sup> | Quantity                              | Value <sup>2</sup> |
| 2003:                           |                            |                    |                        |                    |                                       |                    |
| May                             | 1,510                      | \$46,000           | 55,100                 | \$558,000          | 20,400                                | \$1,220,000        |
| June                            | 3,010                      | 33,900             | 15,100                 | 256,000            | 13,700                                | 1,050,000          |
| July                            | 230                        | 14,600             | 30,600                 | 175,000            | 18,400                                | 1,280,000          |
| August                          | 440                        | 23,500             | 86,200                 | 618,000            | 14,400                                | 787,000            |
| September                       | 475                        | 13,000             | 10,700                 | 126,000            | 9,410                                 | 646,000            |
| October                         | 8,170                      | 84,200             | 47,900                 | 324,000            | 11,300                                | 810,000            |
| November                        | 2,870                      | 83,200             | 68,700                 | 479,000            | 11,300                                | 646,000            |
| December                        | 2,140                      | 66,400             | 53,400                 | 432,000            | 13,100                                | 1,010,000          |
| January-May                     | 11,700                     | 398,000            | 170,000                | 1,560,000          | 75,500                                | 4,480,000          |
| January-December                | 29,000                     | 717,000            | 482,000                | 3,970,000          | 167,000                               | 10,700,000         |
| 2004:                           |                            |                    |                        |                    |                                       |                    |
| January                         | 2,250                      | 100,000            | 48,900                 | 614,000            | 11,400                                | 807,000            |
| February                        | 4,450                      | 118,000            | 152,000                | 1,500,000          | 20,000                                | 856,000            |
| March                           | 6,630                      | 363,000            | 102,000                | 1,030,000          | 20,500                                | 1,290,000          |
| April                           | 13,300                     | 548,000            | 123,000                | 1,190,000          | 10,400                                | 843,000            |
| May:                            |                            |                    |                        |                    |                                       |                    |
| Belgium                         | --                         | --                 | --                     | --                 | 1,590                                 | 112,000            |
| Canada                          | --                         | --                 | --                     | --                 | 1,550                                 | 292,000            |
| China                           | 2,250                      | 108,000            | --                     | --                 | 4                                     | 3,320              |
| France                          | --                         | --                 | --                     | --                 | 1,280                                 | 97,000             |
| Germany                         | 5,780                      | 92,200             | 35,400                 | 222,000            | --                                    | --                 |
| Guadeloupe                      | --                         | --                 | --                     | --                 | 100                                   | 8,950              |
| Ireland                         | --                         | --                 | 5,770                  | 76,500             | 12                                    | 3,840              |
| Israel                          | --                         | --                 | 218                    | 4,000              | --                                    | --                 |
| Japan                           | 1,300                      | 98,700             | 4,230                  | 53,700             | 2,490                                 | 103,000            |
| Tunisia                         | --                         | --                 | 186                    | 2,270              | --                                    | --                 |
| United Kingdom                  | --                         | --                 | 32,100                 | 155,000            | 7,970                                 | 396,000            |
| Total                           | 9,330                      | 299,000            | 78,000                 | 514,000            | 15,000                                | 1,020,000          |
| January-May                     | 35,900                     | 1,430,000          | 505,000                | 4,850,000          | 77,400                                | 4,810,000          |

-- Zero.

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

<sup>2</sup>Customs value.

Source: U.S. Census Bureau, with adjustments by the U.S. Geological Survey.

TABLE 6  
U.S. EXPORTS OF COBALT MATERIALS<sup>1</sup>

(Kilograms, gross weight of material, except as noted)

| Period           | Unwrought cobalt, powders,<br>matte, waste and scrap <sup>2</sup> |                    | Oxides and hydroxides |                    | Salts and compounds <sup>3</sup> |                    | Total cobalt<br>content for<br>the month <sup>5</sup> | Cobalt<br>content,<br>year to<br>date <sup>5, 6</sup> |
|------------------|---|--------------------|-----------------------|--------------------|----------------------------------|--------------------|---|---|
|                  | Quantity  | Value <sup>4</sup> | Quantity              | Value <sup>4</sup> | Quantity                         | Value <sup>4</sup> |   |   |
| 2003:            |   |                    |                       |                    |                                  |                    |   |   |
| May              | 220,000   | \$3,600,000        | 14,200                | \$340,000          | 27,800                           | \$158,000          | 237,000   | 1,030,000   |
| June             | 232,000   | 4,770,000          | 18,600                | 238,000            | 9,710                            | 54,600             | 248,000   | 1,280,000   |
| July             | 191,000   | 6,570,000          | 43,000                | 845,000            | 41,800                           | 294,000            | 232,000   | 1,510,000   |
| August           | 187,000   | 4,270,000          | 17,400                | 338,000            | 56,600                           | 324,000            | 213,000   | 1,720,000   |
| September        | 227,000   | 3,980,000          | 15,200                | 191,000            | 10,000                           | 57,100             | 240,000   | 1,960,000   |
| October          | 184,000   | 2,890,000          | 9,310                 | 166,000            | 118,000                          | 603,000            | 219,000   | 2,180,000   |
| November         | 137,000   | 3,650,000          | 54,500                | 1,010,000          | 70,600                           | 447,000            | 193,000   | 2,370,000   |
| December         | 306,000   | 6,820,000          | 29,500                | 778,000            | 46,200                           | 259,000            | 338,000   | 2,710,000   |
| January-May      | 829,000   | 15,700,000         | 188,000               | 2,550,000          | 262,000                          | 1,330,000          | 1,030,000   | XX  |
| January-December | 2,290,000   | 48,600,000         | 375,000               | 6,110,000          | 615,000                          | 3,370,000          | 2,710,000   | XX  |
| 2004:            |   |                    |                       |                    |                                  |                    |   |   |
| January          | 183,000   | 4,730,000          | 36,600                | 1,430,000          | 75,500                           | 458,000            | 228,000   | 228,000   |
| February         | 214,000   | 9,000,000          | 80,500                | 3,750,000          | 65,800                           | 761,000            | 288,000   | 516,000   |
| March            | 232,000   | 9,740,000          | 11,400                | 359,000            | 78,700                           | 708,000            | 260,000   | 776,000   |
| April            | 154,000   | 6,530,000          | 14,600                | 531,000            | 82,700                           | 867,000            | 185,000   | 960,000   |
| May              | 205,000   | 8,000,000          | 62,000                | 3,130,000          | 14,600                           | 166,000            | 254,000   | 1,210,000   |
| January-May      | 989,000   | 38,000,000         | 205,000               | 9,190,000          | 317,000                          | 2,960,000          | 1,210,000   | XX  |

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>May include other intermediate products of cobalt metallurgy and unwrought cobalt alloys.

<sup>3</sup>Cobalt acetates and cobalt chlorides.

<sup>4</sup>Free alongside ship (f.a.s.) value.

<sup>5</sup>Estimated from gross weights.

<sup>6</sup>Year to date may include revisions to prior months.

Source: U.S. Census Bureau, with adjustments by the U.S. Geological Survey.

TABLE 7  
U.S. EXPORTS OF WROUGHT COBALT, COBALT ORE, AND CONCENTRATES<sup>1</sup>

(Kilograms, gross weight of material, except as noted)

| Period           | Wrought cobalt and cobalt articles |                    | Cobalt ore and concentrates |                        |
|------------------|------------------------------------|--------------------|-----------------------------|------------------------|
|                  | Quantity                           | Value <sup>2</sup> | Quantity                    | Value <sup>2</sup>     |
| 2003:            |                                    |                    |                             |                        |
| May              | 56,100                             | \$2,060,000        | 53,000 <sup>3</sup>         | \$705,000 <sup>3</sup> |
| June             | 100,000                            | 2,940,000          | 238,000 <sup>3</sup>        | 257,000 <sup>3</sup>   |
| July             | 69,200                             | 2,240,000          | 33,100 <sup>3</sup>         | 372,000 <sup>3</sup>   |
| August           | 65,500                             | 2,720,000          | 73,700 <sup>3</sup>         | 473,000 <sup>3</sup>   |
| September        | 89,600                             | 3,090,000          | 32,100 <sup>3</sup>         | 149,000 <sup>3</sup>   |
| October          | 116,000                            | 3,150,000          | 74,400 <sup>3</sup>         | 979,000 <sup>3</sup>   |
| November         | 97,000                             | 2,440,000          | 29,000 <sup>3</sup>         | 559,000 <sup>3</sup>   |
| December         | 83,300                             | 2,470,000          | 76,000 <sup>3</sup>         | 1,990,000 <sup>3</sup> |
| January-May      | 384,000                            | 12,200,000         | 60,700                      | 786,000                |
| January-December | 1,010,000                          | 31,300,000         | 617,000                     | 5,560,000              |
| 2004:            |                                    |                    |                             |                        |
| January          | 50,900                             | 2,400,000          | 126,000                     | 4,320,000              |
| February         | 94,600                             | 3,680,000          | 295,000                     | 3,290,000              |
| March            | 77,000                             | 3,840,000          | 123,000                     | 6,140,000              |
| April            | 78,100                             | 3,300,000          | 110,000                     | 1,600,000              |
| May              | 129,000                            | 4,920,000          | 103,000                     | 2,250,000              |
| January-May      | 429,000                            | 18,100,000         | 758,000                     | 17,600,000             |

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

<sup>2</sup>Free alongside ship (f.a.s.) value.

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

Source: U.S. Census Bureau, with adjustments by the U.S. Geological Survey.