

# Mineral Industry Surveys

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## COBALT IN MARCH 2007

U.S. cobalt consumption during the quarter ending March 31, 2007, was nearly equal in quantity to that consumed during the quarter ending December 31, 2006, and slightly lower than that consumed during the quarter ending March 31, 2006, according to the U.S. Geological Survey. The amount of cobalt contained in U.S. imports of cobalt metals and chemicals was 7% lower during January through February 2007 than that during the same period in 2006. The amount of cobalt contained in U.S. exports of unwrought cobalt and chemicals during January through

February 2007 was almost twice that exported during the same period in 2006.

### Update

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

| <u>Month</u> | <u>Price range</u> | <u>Average price</u> |
|--------------|--------------------|----------------------|
| March 2007   | 31.50-33.00        | 32.05                |

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 |
|-------------------------------|--------------------|---|-------|-------|
| 2006:                         |                    |   |       |       |
| March                         | 323                | 231   | 168   | 722   |
| April                         | 301                | 224   | 171   | 696   |
| May                           | 317                | 239   | 176   | 732   |
| June                          | 311                | 234   | 164   | 709   |
| July                          | 306                | 227   | 158   | 691   |
| August                        | 311                | 235   | 175   | 721   |
| September                     | 305                | 229   | 168   | 702   |
| October                       | 321                | 232   | 158   | 711   |
| November                      | 308                | 222   | 166   | 696   |
| December                      | 297                | 229   | 162   | 688   |
| January-March                 | 967                | 686   | 500   | 2,150 |
| January-December <sup>4</sup> | 3,740              | 2,760   | 2,000 | 8,500 |
| 2007:                         |                    |   |       |       |
| January                       | 309                | 226   | 172   | 707   |
| February                      | 299                | 225   | 162   | 685   |
| March                         | 327                | 233   | 169   | 729   |
| January-March                 | 934                | 683   | 503   | 2,120 |

<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                                | 2006               |                               |                   | 2007  |                            |
|--|--------------------|-------------------------------|-------------------|-------|----------------------------|
|  | January-March      | January-December <sup>2</sup> | Year <sup>3</sup> | March | January-March <sup>4</sup> |
| Steel                                  | 149 <sup>r</sup>   | 588                           | 700               | 49    | 147                        |
| Superalloys                            | 933 <sup>r</sup>   | 3,630                         | 4,180             | 317   | 907                        |
| Magnetic alloys                        | 76 <sup>r</sup>    | 299                           | 386               | 27    | 77                         |
| Other alloys <sup>5</sup>              | W                  | W                             | 224               | W     | W                          |
| Cemented carbides <sup>6</sup>         | 202 <sup>r</sup>   | 796                           | 796               | 66    | 198                        |
| Chemical and ceramic uses <sup>7</sup> | 726 <sup>r</sup>   | 2,910                         | 2,920             | 246   | 723                        |
| Miscellaneous and unspecified          | 68                 | 271                           | 63                | 23    | 68                         |
| Total                                  | 2,150 <sup>r</sup> | 8,500                         | 9,270             | 729   | 2,120                      |

<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>Includes annual reports.

<sup>4</sup>Includes revisions to prior months' data.

<sup>5</sup>Includes nonferrous alloys, welding materials, and wear-resistant alloys.

<sup>6</sup>Includes diamond tool matrices, cemented and sintered carbides, and cast carbide dies or parts.

<sup>7</sup>Includes catalysts, driers in paints or related usages, feed or nutritive additives, glass decolorizer, ground coat frit, pigments,

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 |       |   |
| 2006:     |                       |   |       |       |   |
| March     | 322                   | 172   | 128   | 622   | 1,480                                     |
| April     | 326                   | 170   | 120   | 616   | 1,480                                     |
| May       | 322                   | 179   | 106   | 607   | 1,480                                     |
| June      | 306                   | 168   | 115   | 589   | 1,480                                     |
| July      | 323                   | 165   | 120   | 608   | 1,470                                     |
| August    | 316                   | 164   | 118   | 598   | 1,470                                     |
| September | 304                   | 160   | 116   | 580   | 1,470                                     |
| October   | 296                   | 170   | 120   | 586   | 1,420                                     |
| November  | 289                   | 171   | 126   | 586   | 1,300                                     |
| December  | 288                   | 176   | 126   | 590   | 1,290                                     |
| 2007:     |                       |   |       |       |   |
| January   | 293                   | 180   | 125   | 598   | 1,250                                     |
| February  | 331                   | 177   | 129   | 637   | 1,180                                     |
| March     | 340                   | 171   | 127   | 637   | 1,140                                     |

<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.

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> |   |  |
| 2006:                           |                     |                    |                       |                    |                                  |                    |   |  |
| February                        | 571,000             | \$15,600,000       | 102,000               | \$2,200,000        | 317,000                          | \$3,720,000        | 775,000   | 1,830,000  |
| March                           | 1,160,000           | 30,300,000         | 115,000               | 2,620,000          | 196,000                          | 2,230,000          | 1,320,000   | 3,150,000  |
| April                           | 942,000             | 26,500,000         | 121,000               | 2,850,000          | 165,000                          | 1,640,000          | 1,090,000   | 4,240,000  |
| May                             | 640,000             | 19,300,000         | 102,000               | 2,360,000          | 195,000                          | 2,450,000          | 790,000   | 5,030,000  |
| June                            | 969,000             | 29,500,000         | 42,700                | 1,220,000          | 278,000                          | 2,310,000          | 1,080,000   | 6,110,000  |
| July                            | 741,000             | 21,800,000         | 85,500                | 2,230,000          | 286,000                          | 3,030,000          | 900,000   | 7,010,000  |
| August                          | 694,000             | 21,300,000         | 91,700                | 2,260,000          | 217,000                          | 1,850,000          | 825,000   | 7,840,000  |
| September                       | 1,110,000           | 36,100,000         | 105,000               | 2,770,000          | 83,600                           | 874,000            | 1,210,000   | 9,050,000  |
| October                         | 579,000             | 20,800,000         | 103,000               | 2,730,000          | 170,000                          | 1,800,000          | 706,000   | 9,760,000  |
| November                        | 720,000             | 23,500,000         | 113,000               | 3,280,000          | 105,000                          | 982,000            | 830,000   | 10,600,000   |
| December                        | 917,000             | 32,300,000         | 115,000               | 3,040,000          | 68,400                           | 533,000            | 1,020,000   | 11,600,000   |
| January-February                | 1,480,000           | 40,600,000         | 182,000               | 4,090,000          | 562,000                          | 6,540,000          | 1,830,000   | XX   |
| January-December                | 9,950,000           | 302,000,000        | 1,180,000             | 29,400,000         | 2,330,000                        | 24,200,000         | 11,600,000  | XX   |
| 2007:                           |                     |                    |                       |                    |                                  |                    |   |  |
| January                         | 788,000             | 34,800,000         | 91,400                | 2,940,000          | 193,000                          | 1,900,000          | 906,000   | 906,000  |
| February:                       |                     |                    |                       |                    |                                  |                    |   |  |
| Australia                       | 38,500              | 1,960,000          | --                    | --                 | --                               | --                 | 38,500  | 97,900   |
| Belgium                         | 18,600              | 718,000            | 32,800                | 1,260,000          | 20,000                           | 249,000            | 47,700  | 77,000   |
| Canada                          | 89,000              | 4,350,000          | --                    | --                 | --                               | --                 | 89,000  | 215,000  |
| China                           | 61,300              | 2,860,000          | 8,150                 | 243,000            | --                               | --                 | 67,100  | 140,000  |
| Congo (Kinshasa)                | --                  | --                 | --                    | --                 | --                               | --                 | --  | 22,000   |
| Finland                         | 10,200              | 617,000            | 45,500                | 1,780,000          | 42,400                           | 829,000            | 57,700  | 94,700   |
| France                          | 2,080               | 141,000            | 1,410                 | 51,000             | --                               | --                 | 3,100   | 5,890  |
| Germany                         | 1,830               | 117,000            | 648                   | 42,000             | --                               | --                 | 2,290   | 2,880  |
| India                           | --                  | --                 | --                    | --                 | 18,000                           | 117,000            | 4,860   | 9,230  |
| Japan                           | 9,720               | 458,000            | --                    | --                 | 588                              | 15,900             | 9,880   | 27,100   |
| Korea, Republic of              | --                  | --                 | --                    | --                 | --                               | --                 | --  | 4,450  |
| Morocco                         | 40,000              | 1,930,000          | --                    | --                 | --                               | --                 | 40,000  | 97,000   |
| Norway                          | 180,000             | 8,780,000          | --                    | --                 | --                               | --                 | 180,000   | 374,000  |
| Philippines                     | --                  | --                 | --                    | --                 | --                               | --                 | --  | 42   |
| Russia                          | 151,000             | 6,340,000          | --                    | --                 | 5                                | 2,300              | 151,000   | 294,000  |
| South Africa                    | 60,000              | 2,840,000          | --                    | --                 | --                               | --                 | 60,000  | 60,500   |
| Sweden                          | --                  | --                 | --                    | --                 | --                               | --                 | --  | 790  |
| Uganda                          | --                  | --                 | --                    | --                 | --                               | --                 | --  | 42,100   |
| United Kingdom                  | 3,460               | 117,000            | 22,300                | 857,000            | 60,400                           | 770,000            | 35,900  | 45,200   |
| Zambia                          | 20,100              | 1,050,000          | --                    | --                 | --                               | --                 | 20,100  | 103,000  |
| Total                           | 686,000             | 32,300,000         | 111,000               | 4,230,000          | 141,000                          | 1,980,000          | 807,000   | 1,710,000  |
| January-February                | 1,470,000           | 67,100,000         | 202,000               | 7,180,000          | 335,000                          | 3,890,000          | 1,710,000   | 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.

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> |
| 2006:                           |                            |                    |                        |                    |                                       |                    |
| February                        | 1,380                      | \$53,700           | 68,200                 | \$441,000          | 12,700                                | \$1,080,000        |
| March                           | 1,570                      | 74,900             | 55,200                 | 731,000            | 25,100                                | 1,940,000          |
| April                           | 1,050                      | 60,800             | 29,000                 | 421,000            | 26,700                                | 1,820,000          |
| May                             | 864                        | 78,800             | 26,800                 | 450,000            | 23,600                                | 1,690,000          |
| June                            | 233                        | 19,300             | 149,000                | 1,780,000          | 23,300                                | 1,680,000          |
| July                            | 1,950                      | 26,400             | 47,900                 | 519,000            | 23,700                                | 1,920,000          |
| August                          | 21,200                     | 676,000            | 51,300                 | 708,000            | 18,300                                | 1,470,000          |
| September                       | 447                        | 39,700             | 54,400                 | 677,000            | 14,200                                | 1,360,000          |
| October                         | 3,860                      | 196,000            | 62,200                 | 926,000            | 16,700                                | 1,210,000          |
| November                        | 350                        | 42,000             | 62,200                 | 632,000            | 18,900                                | 1,780,000          |
| December                        | 342                        | 39,400             | 59,400                 | 1,010,000          | 19,900                                | 1,550,000          |
| January-February                | 1,760                      | 67,700             | 128,000                | 1,530,000          | 27,200                                | 2,210,000          |
| January-December                | 33,600                     | 1,320,000          | 726,000                | 9,390,000          | 238,000                               | 18,600,000         |
| 2007:                           |                            |                    |                        |                    |                                       |                    |
| January                         | 4,210                      | 136,000            | 61,200                 | 683,000            | 14,100                                | 1,350,000          |
| February:                       |                            |                    |                        |                    |                                       |                    |
| Canada                          | --                         | --                 | --                     | --                 | 1,960                                 | 342,000            |
| Finland                         | 289                        | 48,200             | --                     | --                 | --                                    | --                 |
| France                          | --                         | --                 | 11,700                 | 173,000            | 2,830                                 | 298,000            |
| Germany                         | --                         | --                 | 17,700                 | 243,000            | 1,110                                 | 150,000            |
| Ireland                         | --                         | --                 | 13,600                 | 196,000            | --                                    | --                 |
| Japan                           | 200                        | 12,400             | --                     | --                 | 4,060                                 | 236,000            |
| Singapore                       | --                         | --                 | 169                    | 3,270              | --                                    | --                 |
| Switzerland                     | --                         | --                 | --                     | --                 | 2                                     | 2,620              |
| Taiwan                          | --                         | --                 | 19,400                 | 214,000            | 7                                     | 3,560              |
| Tunisia                         | --                         | --                 | 5,000                  | 74,200             | --                                    | --                 |
| United Kingdom                  | 26                         | 2,780              | --                     | --                 | 6,210                                 | 418,000            |
| Total                           | 515                        | 63,400             | 67,500                 | 904,000            | 16,200                                | 1,450,000          |
| January-February                | 4,730                      | 199,000            | 129,000                | 1,590,000          | 30,300                                | 2,800,000          |

-- 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.

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> |   |  |
| 2006:            |   |                    |                       |                    |                                  |                    |   |  |
| February         | 96,200  | \$3,960,000        | 91,800                | \$2,170,000        | 43,400                           | \$308,000          | 173,000   | 359,000  |
| March            | 232,000   | 9,530,000          | 93,800                | 2,030,000          | 76,300                           | 518,000            | 318,000   | 678,000  |
| April            | 326,000   | 12,700,000         | 123,000               | 2,710,000          | 19,900                           | 177,000            | 419,000   | 1,100,000  |
| May              | 134,000   | 4,780,000          | 83,300                | 2,060,000          | 79,800                           | 461,000            | 213,000   | 1,310,000  |
| June             | 157,000   | 3,980,000          | 66,000                | 1,680,000          | 50,300                           | 111,000            | 217,000   | 1,530,000  |
| July             | 150,000   | 4,890,000          | 63,300                | 1,370,000          | 33,200                           | 224,000            | 203,000   | 1,730,000  |
| August           | 130,000   | 3,650,000          | 91,000                | 2,180,000          | 64,900                           | 390,000            | 211,000   | 1,940,000  |
| September        | 165,000   | 4,500,000          | 109,000               | 3,010,000          | 20,900                           | 163,000            | 249,000   | 2,190,000  |
| October          | 235,000   | 3,650,000          | 62,300                | 1,800,000          | 15,500                           | 168,000            | 284,000   | 2,470,000  |
| November         | 109,000   | 2,200,000          | 91,200                | 2,180,000          | 31,500                           | 171,000            | 183,000   | 2,660,000  |
| December         | 103,000   | 2,750,000          | 114,000               | 3,020,000          | 48,100                           | 293,000            | 196,000   | 2,850,000  |
| January-February | 192,000   | 7,810,000          | 200,000               | 4,780,000          | 94,800                           | 624,000            | 359,000   | XX   |
| January-December | 1,930,000   | 60,500,000         | 1,100,000             | 26,800,000         | 535,000                          | 3,300,000          | 2,850,000   | XX   |
| 2007:            |   |                    |                       |                    |                                  |                    |   |  |
| January          | 92,800  | 3,720,000          | 90,800                | 3,480,000          | 41,800                           | 208,000            | 168,000   | 168,000  |
| February         | 439,000   | 7,060,000          | 105,000               | 3,630,000          | 38,400                           | 417,000            | 524,000   | 692,000  |
| January-February | 532,000   | 10,800,000         | 196,000               | 7,110,000          | 80,200                           | 625,000            | 692,000   | 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>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> |
| <b>2006:</b>     |                                    |                    |                             |                    |
| February         | 157,000                            | \$7,530,000        | 6,390                       | \$139,000          |
| March            | 219,000                            | 8,340,000          | 28,000                      | 893,000            |
| April            | 183,000                            | 8,250,000          | 69,200                      | 1,170,000          |
| May              | 115,000                            | 5,260,000          | 19,700                      | 493,000            |
| June             | 112,000                            | 6,110,000          | 31,800                      | 423,000            |
| July             | 130,000                            | 7,020,000          | 81,200                      | 1,320,000          |
| August           | 140,000                            | 6,350,000          | 6,690                       | 162,000            |
| September        | 165,000                            | 8,040,000          | 107,000                     | 585,000            |
| October          | 178,000                            | 8,400,000          | 59,700                      | 1,410,000          |
| November         | 209,000                            | 9,960,000          | 20,800                      | 716,000            |
| December         | 185,000                            | 7,980,000          | 59,200                      | 1,700,000          |
| January-February | 345,000                            | 14,700,000         | 11,500                      | 268,000            |
| January-December | 1,980,000                          | 90,400,000         | 495,000                     | 9,130,000          |
| <b>2007:</b>     |                                    |                    |                             |                    |
| January          | 155,000                            | 8,360,000          | 10,400                      | 436,000            |
| February         | 93,000                             | 5,870,000          | 13,600                      | 713,000            |
| January-February | 248,000                            | 14,200,000         | 24,000                      | 1,150,000          |

<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.

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