

# Mineral Industry Surveys

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## MOLYBDENUM IN NOVEMBER 2003

Domestic production of molybdenum in concentrate in November 2003 was about 14% less than that of the previous month and was about 6% less than that of November 2002, according to the U.S. Geological Survey. Year-to-date production of molybdenum in concentrate from January through November was about 5% more than during the same period in 2002. Producer stocks of molybdenum in concentrate, oxide, and other product forms were about 8,250 metric tons (t) at the beginning of 2003 and 4,750 t at the end of November.

According to Ryan's Notes (2003d), the November monthly averages for U.S. ferromolybdenum (FeMo) prices ranged from \$7.014 to \$7.214 per pound of molybdenum content, as compared with \$6.900 to \$7.000 in October. European FeMo monthly averages ranged from \$14.871 to \$15.129 per kilogram of molybdenum content in November as compared with \$14.856 to \$15.078 in October. In November, worldwide molybdenum oxide (MoX) prices ranged from \$5.893 to \$6.064 per pound versus \$5.850 to \$6.017 in October.

Molybdenum oxide and FeMo prices, which had trended downward during the month of November, strengthened in the last week of November. Dealer oxide spot prices were about \$6.10 to \$6.20 per pound in the United States. FeMo prices were reported at \$15 per kilogram in Europe and about \$7.30 per pound in the United States. Traders believe there is little material in stock. As Chinese suppliers were not offering any

bargains, traders were turning to other traders to fill short-term trades (Ryan's Notes, 2003b).

While some molybdenum sellers were convinced prices would stay strong into 2004, others watched for signs of increased byproduct production. Phelps Dodge Corporation announced it had produced 17,100 t (37.7 million pounds) of molybdenum through the first 9 months of 2003, as compared with about 15,000 t (33.1 million pounds) for the similar period in 2002. The company's CEO said that it could quickly increase output in Arizona but had no plans to do so. Southern Peru Copper increased its molybdenum output in the first 9 months of 2003 by 7% to 6,600 t (14.5 million pounds) (Ryan's Notes, 2003c).

Montana Resources, Inc. reportedly has sold its 2004 molybdenum concentrate output, estimated at 3,200 t (7 million pounds), to three parties. The buyers are thought to be Thompson Creek Mining Company, 60%; Phelps Dodge, 20%; and Sadaci NV, 20% (Ryan's Notes, 2003a).

### References Cited

- Ryan's Notes, 2003a, Ferroalloy notes: Ryan's Notes, v. 9, no. 44, November 3, p. 4.
- Ryan's Notes, 2003b, Moly price may have legs: Ryan's Notes, v. 9, no. 47, November 24, p. 3.
- Ryan's Notes, 2003c, Moly's strength on shaky foundation: Ryan's Notes, v. 9, no. 46, November 17, p. 3.
- Ryan's Notes, 2003d, [untitled]: Ryan's Notes, v. 9, no. 49, December 8, p. 4.

TABLE 1  
U.S. SALIENT MOLYBDENUM CONCENTRATE STATISTICS<sup>1</sup>

(Metric tons, contained molybdenum)

|                         | 2002             | 2003    |          | Year to date |
|-------------------------|------------------|---------|----------|--------------|
|                         | January-December | October | November |              |
| Production              | 32,400           | 2,810   | 2,420    | 30,900       |
| Shipments: <sup>2</sup> |                  |         |          |              |
| Domestic                | 21,200           | 981     | 629      | 11,300       |
| Export                  | 11,100           | 1,890   | 1,720    | 19,500       |

<sup>1</sup>Data are rounded to no more than three significant digits.

<sup>2</sup>As reported by producers.

TABLE 2  
U.S. REPORTED PRODUCTION AND SHIPMENTS OF MOLYBDENUM PRODUCTS<sup>1</sup>

(Metric tons, contained molybdenum)

|                                   | 2002             | 2003    |          | Year to date |
|-----------------------------------|------------------|---------|----------|--------------|
|                                   | January-December | October | November |              |
| Gross production                  | 31,300           | 3,080   | 4,260    | 36,900       |
| Internal consumption <sup>2</sup> | 20,700           | 2,320   | 2,800    | 26,700       |
| Gross shipments                   | 27,500           | 2,670   | 2,590    | 28,200       |

<sup>1</sup>Data are rounded to no more than three significant digits.

<sup>2</sup>Includes molybdic oxides, metal powder, ammonium molybdate, sodium molybdate, and other.

TABLE 3  
U.S. REPORTED CONSUMPTION, BY END USES, AND CONSUMER STOCKS OF MOLYBDENUM MATERIALS<sup>1</sup>

(Kilograms, contained molybdenum)

| End use  | Molybdic oxides | Ferro molybdenum <sup>2</sup> | Ammonium and sodium molybdate | Molybdenum scrap | Other   | Total     |
|--|-----------------|-------------------------------|-------------------------------|------------------|---------|-----------|
| 2003, October:   |                 |                               |                               |                  |         |           |
| Steel:   |                 |                               |                               |                  |         |           |
| Carbon   | 10,600          | W                             | --                            | --               | W       | 10,600    |
| High-strength low-alloy                                  | 32,500          | 8,010                         | --                            | --               | --      | 40,500    |
| Stainless and heat-resisting                             | 167,000         | 59,900                        | --                            | --               | 7,180   | 234,000   |
| Full alloy   | 100,000         | 163,000                       | --                            | --               | 1,860   | 265,000   |
| Tool   | 57,000          | W                             | --                            | --               | W       | 57,000    |
| Total  | 368,000         | 230,000                       | --                            | --               | 9,040   | 607,000   |
| Cast irons (gray, malleable, and ductile iron)           | W               | 15,600                        | --                            | --               | 763     | 16,300    |
| Superalloys  | 75,900          | W                             | --                            | (3)              | 98,500  | 174,000   |
| Alloys: (other than steels, cast irons, and superalloys) |                 |                               |                               |                  |         |           |
| Welding materials (structural and hard-facing)           | --              | W                             | --                            | --               | 6       | 6         |
| Other alloys   | 191             | 2,370                         | --                            | --               | 2,610   | 5,170     |
| Mill products made from metal powder <sup>4</sup>        | --              | --                            | --                            | --               | 107,000 | 107,000   |
| Cemented carbides and related product <sup>5</sup>       | --              | --                            | --                            | --               | --      | --        |
| Chemical and ceramic uses:                               |                 |                               |                               |                  |         |           |
| Pigments   | --              | --                            | W                             | --               | --      | W         |
| Catalysts  | 77,300          | --                            | W                             | --               | W       | 77,300    |
| Other chemicals  | --              | --                            | --                            | --               | 1,190   | 1,190     |
| Miscellaneous and unspecified uses:                      |                 |                               |                               |                  |         |           |
| Lubricants   | --              | --                            | --                            | --               | 16,000  | 16,000    |
| Other  | 14,300          | 38,300                        | 75,800                        | --               | 17,400  | 146,000   |
| Grand total  | 535,000         | 287,000                       | 75,800                        | --               | 253,000 | 1,150,000 |
| Stocks, October 31, 2003                                 | 372,000         | 172,000                       | 5,300                         | 21,400           | 870,000 | 1,440,000 |
| 2003, November:  |                 |                               |                               |                  |         |           |
| Steel:   |                 |                               |                               |                  |         |           |
| Carbon   | 11,900          | W                             | --                            | --               | W       | 11,900    |
| High-strength low-alloy                                  | 27,100          | 8,130                         | --                            | --               | --      | 35,200    |
| Stainless and heat-resisting                             | 163,000         | 62,500                        | --                            | --               | 7,180   | 233,000   |
| Full alloy   | 97,700          | 165,000                       | --                            | --               | 1,860   | 264,000   |
| Tool   | 58,300          | W                             | --                            | --               | W       | 58,300    |
| Total  | 358,000         | 235,000                       | --                            | --               | 9,040   | 603,000   |
| Cast irons (gray, malleable, and ductile iron)           | W               | 8,180                         | --                            | --               | 763     | 8,940     |
| Superalloys  | 42,400          | W                             | --                            | (3)              | 85,700  | 128,000   |
| Alloys: (other than steels, cast irons, and superalloys) |                 |                               |                               |                  |         |           |
| Welding materials (structural and hard-facing)           | --              | W                             | --                            | --               | 6       | 6         |
| Other alloys   | 215             | 2,440                         | --                            | --               | 2,610   | 5,270     |
| Mill products made from metal powder <sup>4</sup>        | --              | --                            | --                            | --               | 66,800  | 66,800    |
| Cemented carbides and related product <sup>5</sup>       | --              | --                            | --                            | --               | W       | --        |
| Chemical and ceramic uses:                               |                 |                               |                               |                  |         |           |
| Pigments   | --              | --                            | W                             | --               | --      | W         |
| Catalysts  | 77,300          | --                            | W                             | --               | W       | 77,300    |
| Other chemicals  | --              | --                            | --                            | --               | 1,190   | 1,190     |
| Miscellaneous and unspecified uses:                      |                 |                               |                               |                  |         |           |
| Lubricants   | --              | --                            | --                            | --               | 18,500  | 18,500    |
| Other  | 1,090           | 31,800                        | 76,100                        | --               | 17,400  | 126,000   |
| Grand total  | 479,000         | 278,000                       | 76,100                        | --               | 202,000 | 1,040,000 |
| Stocks, November 30, 2003                                | 361,000         | 183,000                       | 5,240                         | 29,900           | 865,000 | 1,450,000 |

W Withheld to avoid disclosing company proprietary data; included in "Other" of the "Miscellaneous and unspecified uses" category. -- Zero.

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

<sup>2</sup>Includes calcium molybdate.

<sup>3</sup>Included in "Other" of the "Superalloys" category.

<sup>4</sup>Includes ingot, wire, rod, and sheet.

<sup>5</sup>Includes construction, mining, oil and gas, metal working machinery.

TABLE 4  
U.S. EXPORTS OF MOLYBDENUM ORES AND CONCENTRATES  
(including roasted concentrate), BY COUNTRY<sup>1</sup>

(Kilograms, contained molybdenum)

| Country            | 2002             | 2003      |           | Year to date |
|--------------------|------------------|-----------|-----------|--------------|
|                    | January-December | September | October   |              |
| Australia          | 46,900           | 3,540     | 19,100    | 96,000       |
| Belgium            | 4,380,000        | 139,000   | 420,000   | 2,730,000    |
| Brazil             | 32,600           | 4,690     | 1,980     | 37,100       |
| Canada             | 1,080,000        | 46,700    | 20,200    | 847,000      |
| Chile              | 16,200           | --        | --        | 14,200       |
| China              | 56,700           | --        | 59,500    | 63,100       |
| Germany            | 64,400           | --        | --        | 1,440        |
| India              | 141,000          | 182       | --        | 11,500       |
| Italy              | 47,900           | --        | --        | 15,200       |
| Japan              | 1,130,000        | 197,000   | 201,000   | 1,720,000    |
| Korea, Republic of | 70,600           | 2,950     | 3,290     | 58,700       |
| Mexico             | 484,000          | 345,000   | 162,000   | 3,520,000    |
| Netherlands        | 7,330,000        | 1,500,000 | 1,470,000 | 9,650,000    |
| Spain              | 41,200           | --        | --        | 4,130        |
| Sweden             | 35,000           | --        | --        | 25,700       |
| Taiwan             | 12,600           | --        | --        | 9,590        |
| United Kingdom     | 4,330,000        | 1,360,000 | 688,000   | 6,440,000    |
| Other              | 153,000          | 5,650     | 11,900    | 113,000      |
| Total              | 19,500,000       | 3,600,000 | 3,050,000 | 25,400,000   |

-- Zero.

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

Source: U.S. Census Bureau.

TABLE 5  
U.S. EXPORTS OF FERROMOLYBDENUM, BY COUNTRY<sup>1</sup>

(Kilograms, contained molybdenum)

| Country     | 2002             | 2003      |         | Year to date |
|-------------|------------------|-----------|---------|--------------|
|             | January-December | September | October |              |
| Australia   | --               | --        | --      | 546          |
| Canada      | 597,000          | 93,300    | 43,800  | 418,000      |
| Chile       | 240              | --        | --      | --           |
| Denmark     | 5,110            | --        | --      | 241          |
| Japan       | --               | --        | --      | 61           |
| Mexico      | 51,400           | 2,610     | 10,300  | 32,200       |
| Netherlands | --               | --        | --      | 25,500       |
| Switzerland | 21,800           | --        | --      | --           |
| Taiwan      | 274              | --        | --      | --           |
| Total       | 676,000          | 95,900    | 54,100  | 476,000      |

-- Zero.

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

Source: U.S. Census Bureau.

TABLE 6  
U.S. IMPORTS FOR CONSUMPTION OF MOLYBDENUM PRODUCTS<sup>1</sup>

(Kilograms, unless otherwise specified)

| Material                     | January-December 2002 |                      |                            | October 2003 |                      |                            |
|------------------------------|-----------------------|----------------------|----------------------------|--------------|----------------------|----------------------------|
|                              | Gross weight          | Contained molybdenum | Value (c.i.f.) (thousands) | Gross weight | Contained molybdenum | Value (c.i.f.) (thousands) |
| Ore and concentrates roasted | 7,030,000             | 4,370,000            | \$33,500                   | 581,000      | 362,000              | \$4,360                    |
| Ore and concentrates other   | 664,000               | 340,000              | 3,450                      | 80,100       | 38,100               | 490                        |
| Molybdenum chemicals:        |                       |                      |                            |              |                      |                            |
| Oxides and hydroxides        | 1,200,000             | NA                   | 7,660                      | 36,100       | NA                   | 296                        |
| Molydates of ammonium        | 1,740,000             | 1,010,000            | 11,200                     | 120,000      | 67,300               | 860                        |
| Molydates (all others)       | 435,000               | 88,600               | 1,630                      | 225          | 222                  | 5                          |
| Molybdenum orange            | 1,300,000             | NA                   | 5,490                      | 85,900       | NA                   | 362                        |
| Ferromolybdenum              | 5,570,000             | 3,590,000            | 31,400                     | 525,000      | 329,000              | 4,260                      |
| Molybdenum powders           | 39,500                | 31,700               | 1,110                      | 4,010        | 2,340                | 166                        |
| Molybdenum unwrought         | 43,500                | 43,200               | 542                        | 5,000        | 4,990                | 67                         |
| Molybdenum waste and scrap   | 697,000               | 617,000              | 6,910                      | 36,900       | 30,800               | 337                        |
| Molybdenum wire              | 14,600                | NA                   | 697                        | 573          | NA                   | 52                         |
| Molybdenum other             | 84,800                | NA                   | 7,240                      | 8,280        | NA                   | 702                        |
| Total                        | 18,800,000            | 10,100,000           | 111,000                    | 1,480,000    | 835,000              | 12,000                     |

NA Not available.

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

Source: U.S. Census Bureau.