

# Mineral Industry Surveys

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## MOLYBDENUM IN OCTOBER 2010

Domestic production of molybdenum (Mo) in concentrate in October 2010 was 23% more than the output of the previous month and about 29% more than that of October 2009, according to the U.S. Geological Survey. Producer stocks of molybdenum in concentrate, oxide, and other product forms were about 6,070 metric tons (t) at the beginning of 2010 and about 9,150 t at the end of October.

According to Ryan's Notes, the October monthly average price range for U.S. ferromolybdenum (FeMo) was \$17.689 to \$18.022 per pound of molybdenum content, compared with \$17.975 to \$18.463 per pound in September. European FeMo monthly averages ranged from \$38.222 to \$38.833 per kilogram (kg) of molybdenum content in October compared with \$39.519 to \$40.094 per kg in September. In October, worldwide molybdenum oxide (MoO<sub>3</sub>) prices ranged from \$15.139 to \$15.406 per pound compared with \$15.375 to \$15.850 per pound in September.

Freeport-McMoRan Copper & Gold Inc. (FCX) reported third quarter consolidated sales of 7,700 t of molybdenum from its mines, compared with 7,300 t of molybdenum in the third

quarter of 2009. In the first 9 months, FCX's cumulative molybdenum production rose to 23,000 t of molybdenum, compared with 19,000 t of molybdenum in 2009. The Henderson primary molybdenum mine reported output of 14,000 t of molybdenum in the first 9 months, compared with 9,500 t in the first 9 months of 2009. FCX attributed the increase to improved market conditions that have resulted in an increase in operating rates at its Henderson Mine to approximately 90% of production capacity (Ryan's Notes, 2010).

Included in this Mineral Industry Surveys are U.S. production and shipments of molybdenum concentrates and materials, U.S. consumption by end use, and consumer stocks of molybdenum material in September and October 2010. Export data for August and September 2010 and import data for September 2010 are also included.

### Reference Cited

Ryan's Notes, 2010, FCX's moly sales rise in Q3: Ryan's Notes, v. 16, no. 41, October 25, p. 1.

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

(Metric tons, contained molybdenum)

|                         | 2009                              |                     | 2010               |         |                                  |
|-------------------------|-----------------------------------|---------------------|--------------------|---------|----------------------------------|
|                         | January-<br>December <sup>p</sup> | January-<br>October | September          | October | January-<br>October <sup>2</sup> |
| Production              | 47,700                            | 40,300              | 4,580 <sup>r</sup> | 5,660   | 48,300                           |
| Shipments: <sup>3</sup> |                                   |                     |                    |         |                                  |
| Domestic                | 12,200                            | 10,300              | 1,170              | 1,130   | 11,400                           |
| Export                  | 12,800                            | 10,400              | W                  | W       | W                                |

<sup>p</sup>Preliminary. <sup>r</sup>Revised. W Withheld to avoid disclosing company proprietary data.

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

<sup>2</sup>May include revisions to prior months.

<sup>3</sup>As reported by producers.

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

(Metric tons, contained molybdenum)

|                                   | 2009                              |                     | 2010      |         |                                  |
|-----------------------------------|-----------------------------------|---------------------|-----------|---------|----------------------------------|
|                                   | January-<br>December <sup>p</sup> | January-<br>October | September | October | January-<br>October <sup>2</sup> |
| Gross production                  | 59,900                            | 49,700 <sup>r</sup> | 6,280     | 5,970   | 59,100                           |
| Internal consumption <sup>3</sup> | 26,200                            | 21,700              | W         | W       | W                                |
| Gross shipments                   | 43,300                            | 36,300 <sup>r</sup> | 4,640     | 4,110   | 42,700                           |

<sup>p</sup>Preliminary. <sup>r</sup>Revised. W Withheld to avoid disclosing company proprietary data.

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

<sup>2</sup>May include revisions for prior months.

<sup>3</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  | Molybdc<br>oxides    | Ferro<br>molyb-<br>denum <sup>2</sup> | Ammonium<br>and sodium<br>molybdate | Molyb-<br>denum<br>scrap | Other   | Total                  |
|--|----------------------|---------------------------------------|-------------------------------------|--------------------------|---------|------------------------|
| 2010:  |                      |                                       |                                     |                          |         |                        |
| September:   |                      |                                       |                                     |                          |         |                        |
| Steel:   |                      |                                       |                                     |                          |         |                        |
| Carbon   | 32,200               | W                                     | --                                  | --                       | W       | 32,200                 |
| High-strength low-alloy                                  | 47,500               | 7,780                                 | --                                  | --                       | --      | 55,300                 |
| Stainless and heat-resisting                             | 154,000              | 62,200 <sup>r</sup>                   | --                                  | W                        | 6,510   | 222,000                |
| Full alloy   | 249,000              | 258,000                               | --                                  | --                       | W       | 506,000                |
| Tool   | W                    | W                                     | --                                  | --                       | --      | W                      |
| Total  | 482,000              | 328,000 <sup>r</sup>                  | --                                  | W                        | 6,510   | 816,000                |
| Cast irons (gray, malleable, and ductile iron)           | W                    | W                                     | --                                  | --                       | W       | W                      |
| Superalloys  | 44,500               | W                                     | --                                  | 38,200                   | 82,200  | 165,000                |
| Alloys: (other than steels, cast irons, and superalloys) |                      |                                       |                                     |                          |         |                        |
| Welding materials (structural and hard-facing)           | --                   | W                                     | --                                  | --                       | W       | W                      |
| Other alloys   | 345                  | W                                     | --                                  | --                       | --      | 345                    |
| Mill products made from metal powder <sup>3</sup>        | --                   | --                                    | --                                  | --                       | W       | W                      |
| Cemented carbides and related products <sup>4</sup>      | --                   | --                                    | --                                  | --                       | 6       | 6                      |
| Chemical and ceramic uses:                               |                      |                                       |                                     |                          |         |                        |
| Pigments   | --                   | --                                    | W                                   | --                       | --      | W                      |
| Catalysts  | 77,300               | --                                    | W                                   | --                       | W       | 77,300                 |
| Other chemicals  | --                   | --                                    | --                                  | --                       | W       | W                      |
| Miscellaneous and unspecified uses:                      |                      |                                       |                                     |                          |         |                        |
| Lubricants   | --                   | --                                    | --                                  | --                       | 10,800  | 10,800                 |
| Other  | 66,700               | 52,500                                | 72,600                              | 1,840                    | 222,000 | 416,000                |
| Grand total  | 671,000              | 380,000                               | 72,600                              | 40,000                   | 322,000 | 1,490,000 <sup>r</sup> |
| Stocks, September 30, 2010                               | 308,000 <sup>r</sup> | 297,000                               | 3,150                               | (5)                      | (5)     | 1,480,000              |
| October:   |                      |                                       |                                     |                          |         |                        |
| Steel:   |                      |                                       |                                     |                          |         |                        |
| Carbon   | 31,800               | W                                     | --                                  | --                       | W       | 31,800                 |
| High-strength low-alloy                                  | 57,500               | 8,330                                 | --                                  | --                       | --      | 65,800                 |
| Stainless and heat-resisting                             | 160,000              | 63,900                                | --                                  | W                        | 6,510   | 231,000                |
| Full alloy   | 251,000              | 289,000                               | --                                  | --                       | W       | 539,000                |
| Tool   | W                    | W                                     | --                                  | --                       | --      | W                      |
| Total  | 500,000              | 361,000                               | --                                  | W                        | 6,510   | 868,000                |
| Cast irons (gray, malleable, and ductile iron)           | W                    | W                                     | --                                  | --                       | W       | W                      |
| Superalloys  | 25,500               | W                                     | --                                  | 45,100                   | 81,900  | 153,000                |
| Alloys: (other than steels, cast irons, and superalloys) |                      |                                       |                                     |                          |         |                        |
| Welding materials (structural and hard-facing)           | --                   | W                                     | --                                  | --                       | W       | W                      |
| Other alloys   | 104                  | W                                     | --                                  | --                       | --      | 104                    |
| Mill products made from metal powder <sup>3</sup>        | --                   | --                                    | --                                  | --                       | W       | W                      |
| Cemented carbides and related products <sup>4</sup>      | --                   | --                                    | --                                  | --                       | 6       | 6                      |
| Chemical and ceramic uses:                               |                      |                                       |                                     |                          |         |                        |
| Pigments   | --                   | --                                    | W                                   | --                       | --      | W                      |
| Catalysts  | 77,300               | --                                    | W                                   | --                       | W       | 77,300                 |
| Other chemicals  | --                   | --                                    | --                                  | --                       | W       | W                      |

See footnotes at end of table.

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

(Kilograms, contained molybdenum)

| End use                             | Molybdc<br>oxides | Ferro<br>molyb-<br>denum <sup>2</sup> | Ammonium<br>and sodium<br>molybdate | Molyb-<br>denum<br>scrap | Other   | Total     |
|-------------------------------------|-------------------|---------------------------------------|-------------------------------------|--------------------------|---------|-----------|
| 2010:                               |                   |                                       |                                     |                          |         |           |
| October—Continued:                  |                   |                                       |                                     |                          |         |           |
| Miscellaneous and unspecified uses: |                   |                                       |                                     |                          |         |           |
| Lubricants                          | --                | --                                    | --                                  | --                       | 10,800  | 10,800    |
| Other                               | 66,700            | 51,600                                | 73,700                              | 1,840                    | 230,000 | 424,000   |
| Grand total                         | 670,000           | 412,000                               | 73,700                              | 46,900                   | 329,000 | 1,530,000 |
| Stocks, October 31, 2010            | 298,000           | 292,000                               | 2,100                               | (5)                      | (5)     | 1,480,000 |

<sup>1</sup>Revised. 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>Includes ingot, wire, rod, and sheet.

<sup>4</sup>Includes construction, mining, oil and gas, metalworking machinery.

<sup>5</sup>Withheld to avoid disclosing company proprietary data; included in "Total."

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

(Kilograms, contained molybdenum)

| Country              | 2009                 |           |                       | 2010      |           |                       |
|----------------------|----------------------|-----------|-----------------------|-----------|-----------|-----------------------|
|                      | January-<br>December | September | January-<br>September | August    | September | January-<br>September |
| Argentina            | --                   | --        | --                    | --        | 13,200    | 13,200                |
| Australia            | 159                  | --        | 159                   | --        | --        | --                    |
| Austria              | --                   | --        | --                    | 12,400    | 50,000    | 113,000               |
| Belgium              | 7,060,000            | 726,000   | 4,880,000             | 1,040,000 | 588,000   | 7,030,000             |
| Brazil               | 49,100               | --        | 49,100                | 12,900    | 36,700    | 192,000               |
| Canada               | 1,070,000            | 139,000   | 831,000               | 107,000   | 44,600    | 768,000               |
| Chile                | 212,000              | --        | 212,000               | --        | --        | --                    |
| China                | 6,680,000            | 566,000   | 4,670,000             | 442,000   | 299,000   | 4,010,000             |
| France               | --                   | --        | --                    | --        | --        | 4,410                 |
| Germany              | --                   | --        | --                    | 36,400    | --        | 143,000               |
| Hong Kong            | 38,900               | --        | --                    | --        | --        | --                    |
| India                | 144,000              | --        | 139,000               | 118,000   | 99,500    | 601,000               |
| Japan                | 912,000              | 97,500    | 648,000               | 246,000   | 235,000   | 1,630,000             |
| Kenya                | 23,200               | --        | 23,200                | --        | --        | --                    |
| Korea, Republic of   | 884,000              | 32,600    | 678,000               | 81,700    | 105,000   | 624,000               |
| Mexico               | 2,870,000            | --        | 2,120,000             | 311,000   | 312,000   | 3,620,000             |
| Netherlands          | 6,510,000            | 1,030,000 | 5,360,000             | 596,000   | 660,000   | 6,340,000             |
| New Caledonia        | --                   | --        | --                    | --        | --        | 1,050                 |
| Poland               | --                   | --        | --                    | --        | --        | 194                   |
| Slovenia             | --                   | --        | --                    | 12,200    | --        | 24,600                |
| South Africa         | 431,000              | 51,300    | 371,000               | 100,000   | 100,000   | 503,000               |
| Spain                | --                   | --        | --                    | --        | --        | 24,600                |
| Sweden               | 1,140                | 1,140     | 1,140                 | --        | --        | --                    |
| Taiwan               | 20,000               | 17,100    | 20,000                | 1,100     | --        | 26,500                |
| Thailand             | 9,620                | 9,620     | 9,620                 | --        | --        | 19,200                |
| United Arab Emirates | 5,910                | --        | 5,910                 | 25,000    | 62,300    | 117,000               |
| United Kingdom       | 2,440,000            | 229,000   | 2,120,000             | 415,000   | 351,000   | 3,400,000             |
| Venezuela            | 1,580                | --        | 1,580                 | --        | --        | 940                   |
| Vietnam              | 229,000              | 50,300    | 200,000               | --        | 12,500    | 63,900                |
| Total                | 29,600,000           | 2,950,000 | 22,300,000            | 3,560,000 | 2,970,000 | 29,300,000            |

-- 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              | 2009                 |           |                       | 2010    |           |                       |
|----------------------|----------------------|-----------|-----------------------|---------|-----------|-----------------------|
|                      | January-<br>December | September | January-<br>September | August  | September | January-<br>September |
| Argentina            | 13,200               | --        | 13,200                | 13,300  | --        | 13,300                |
| Australia            | --                   | --        | --                    | --      | --        | 628                   |
| Belgium              | 13,500               | --        | 13,500                | --      | --        | --                    |
| Canada               | 581,000              | 91,700    | 383,000               | 62,100  | 65,800    | 541,000               |
| China                | 25,300               | --        | 25,300                | --      | --        | --                    |
| Colombia             | 1,280                | --        | 1,280                 | --      | 551       | 1,170                 |
| Denmark              | 200                  | --        | --                    | --      | --        | 172                   |
| India                | 65,300               | --        | 65,300                | --      | 12,600    | 23,500                |
| Israel               | 95                   | --        | 95                    | --      | --        | --                    |
| Korea, Republic of   | 26,800               | --        | 26,800                | 11,200  | --        | 11,200                |
| Mexico               | 55,200               | 900       | 36,200                | 4,100   | --        | 9,620                 |
| Netherlands          | 24,000               | 12,200    | 24,000                | 26,500  | 41,200    | 93,200                |
| Peru                 | 3,180                | --        | 3,180                 | --      | --        | --                    |
| Philippines          | 1,210                | 270       | 1,210                 | --      | --        | 939                   |
| Singapore            | --                   | --        | --                    | --      | --        | 7,380                 |
| Taiwan               | 12,500               | --        | 12,500                | --      | --        | --                    |
| Turkey               | --                   | --        | --                    | 103     | --        | 103                   |
| United Arab Emirates | 3,260                | --        | 3,260                 | --      | --        | --                    |
| Total                | 827,000              | 105,000   | 608,000               | 117,000 | 120,000   | 703,000               |

-- 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 2009 |                      |                                | September 2010 |                      |                                | January-September 2010 |                      |                                |
|------------------------------|-----------------------|----------------------|--------------------------------|----------------|----------------------|--------------------------------|------------------------|----------------------|--------------------------------|
|                              | Gross weight          | Contained molybdenum | Value <sup>2</sup> (thousands) | Gross weight   | Contained molybdenum | Value <sup>2</sup> (thousands) | Gross weight           | Contained molybdenum | Value <sup>2</sup> (thousands) |
| Ore and concentrates roasted | 7,780,000             | 4,800,000            | \$94,800                       | 729,000        | 444,000              | \$7,300                        | 8,060,000              | 4,960,000            | \$89,500                       |
| Ore and concentrates other   | 5,590,000             | 2,720,000            | 54,900                         | 1,360,000      | 714,000              | 20,700                         | 9,380,000              | 4,530,000            | 137,000                        |
| Molybdenum chemicals:        |                       |                      |                                |                |                      |                                |                        |                      |                                |
| Oxides and hydroxides        | 209,000               | NA                   | 3,330                          | 61,300         | NA                   | 1,420                          | 436,000                | NA                   | 9,950                          |
| Molybdates of ammonium       | 1,140,000             | 642,000              | 19,400                         | 247,000        | 149,000              | 4,520                          | 1,470,000              | 837,000              | 26,400                         |
| Molybdates (all others)      | 30,300                | 14,500               | 1,090                          | 2,230          | 1,060                | 32                             | 54,400                 | 20,000               | 1,300                          |
| Molybdenum orange            | 269,000               | NA                   | 2,170                          | 24,400         | NA                   | 196                            | 293,000                | NA                   | 2,220                          |
| Ferromolybdenum              | 3,040,000             | 2,030,000            | 50,100                         | 590,000        | 392,000              | 14,300                         | 4,250,000              | 2,840,000            | 102,000                        |
| Molybdenum powders           | 60,000                | 52,500               | 2,870                          | 57,400         | 55,400               | 2,410                          | 204,000                | 195,000              | 8,830                          |
| Molybdenum unwrought         | 107,000               | 97,800               | 2,880                          | --             | --                   | --                             | 173,000                | 173,000              | 5,440                          |
| Molybdenum waste and scrap   | 482,000               | 473,000              | 15,300                         | 20,800         | 19,700               | 621                            | 561,000                | 540,000              | 21,600                         |
| Molybdenum wire              | 15,100                | NA                   | 2,120                          | 1,060          | NA                   | 189                            | 13,100                 | NA                   | 2,120                          |
| Molybdenum other             | 306,000               | NA                   | 19,800                         | 38,400         | NA                   | 3,790                          | 440,000                | NA                   | 27,300                         |
| Total                        | 19,000,000            | XX                   | 269,000                        | 3,130,000      | XX                   | 55,500                         | 25,300,000             | XX                   | 434,000                        |

NA Not available. 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>Customs value.

Source: U.S. Census Bureau.