

Mineral Industry Surveys

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BISMUTH IN THE FIRST QUARTER 2007

Bismuth consumption in the United States for the first quarter of 2007 was estimated to be 570 metric tons (t), which was about 61% above that of the fourth quarter 2006 and about 9% above that of the first quarter 2006. The estimated consumption breakdown for bismuth in the first quarter was 44% for metallurgical additives and galvanizing; 31% for fusible alloys, solders, and ammunition; 24% for chemical and pharmaceutical uses; and 1% for other (table 2).

The New York dealer price for bismuth, as published in *Platts Metals Week*, started the month of January at \$7.30 to \$7.80 per pound and rose steadily through the first quarter, ending March at \$10.50 to \$11.00 per pound.

Bismuth prices were on a strong upward trend through the first quarter of 2007, and that pattern continued into April. In mid-April, bismuth prices reportedly were reaching \$14 per pound. India, Japan, the Republic of Korea, and Taiwan have all been mentioned as countries currently experiencing strong bismuth demand. Consumption levels in China remain clouded, but Chinese consumption reportedly has increased from 2,000 to 4,000 metric tons per year (t/yr) compared with about 1,000 t/yr a few years ago. China reportedly exported 6,000 t of bismuth in 2006, but may have to reduce future exports if the bullish estimates on the country's consumption are accurate (*Metal Bulletin*, 2007).

Reports from China detailed some of the supply difficulties being encountered there. Shizhuyuan Nonferrous Metal Co., one of China's leading bismuth refiners, announced that it had only produced 40 t of bismuth in January instead of its usual 60 t, owing to difficulties in mining during the winter and the declining bismuth content in its ores. Chenzhou Jinwang Enterprises, Co., an important private smelter in Central Hunan Province producing 1,000 t/yr of bismuth, announced that it would be closed for most of February for maintenance (*Mining Journal*, 2007). In China, Ganzhou Nonferrous Metal Co. announced plans to further increase its bismuth metal output to

about 1,000 t in 2007 from 600 t in 2006 (*Platts Metals Week*, 2007).

Fortune Minerals Ltd. (London, Ontario, Canada) announced further progress with its 90% owned NICO gold-cobalt-bismuth project in the Northwest Territories of Canada. Metallurgical test work at SGS Lakefield Research produced an upgraded bismuth (metal) bullion product from concentrate at the NICO project. Production of bismuth metal at the NICO site would significantly reduce transportation and treatment charges from a third-party bismuth smelter and may materially improve the economics for the NICO project. Two process methods were evaluated during the current program. The one using ferric chloride leaching and iron cementation hydrometallurgical processing proved to be the most effective, with bismuth grades and recoveries sharply exceeding Fortune's expectations. The previously announced positive full feasibility study assessing the NICO project led by Micon International Ltd. envisioned a process plant producing 99.8% cobalt cathode, gold bullion, and bismuth concentrate averaging 45% bismuth. The preliminary results of this latest metallurgical test work indicated that a 94% bismuth metal product could now be produced at the site with recoveries in excess of 95% of the bismuth contained in the concentrate (Fortune Minerals Ltd., 2007).

References Cited

- Fortune Minerals Ltd., 2007, Fortune Minerals announces successful NICO metallurgical test work for upgraded bismuth product: London, Ontario, Canada, Fortune Materials Ltd. news release, May 1, 2 p.
- Metal Bulletin, 2007, Bismuth eyes \$14 per pound amid Chinese export quota talk: *Metal Bulletin*, no. 8991, April 16, p. 12.
- Mining Journal, 2007, Mixed fortunes for minor metals: *Mining Journal*, March 2, p. 4.
- Platts Metals Week, 2007, Ganzhou to raise bismuth output: *Platts Metals Week*, v. 78, no. 5, January 29, p. 4.

TABLE 1
SALIENT BISMUTH STATISTICS¹

(Kilograms unless otherwise specified)

	2006 ^P		2007
	Year	First quarter	First quarter
Consumption	1,970,000	521,000	570,000
Exports ²	311,000	37,400	143,000 ³
Imports for consumption	2,300,000	483,000	466,000 ³
Price per pound, dealer, average of period	\$5.03	\$4.70	\$9.35
Stocks, end of period, consumer	156,000	129,000	140,000

^PPreliminary.

¹Data are rounded to no more than three significant digits.

²Comprises bismuth metal and the bismuth content of alloys and waste and scrap.

³Import and export data for March 2007 were not available at time of publication.

TABLE 2
ESTIMATED BISMUTH METAL CONSUMED
IN THE UNITED STATES, BY USE¹

(Kilograms)

Use	2006 ^P		2007
	Year	First quarter	First quarter
Chemicals ²	360,000	83,500	137,000
Bismuth alloys	662,000	159,000	178,000
Metallurgical additives	925,000	270,000	252,000
Other	23,300	8,240	4,000
Total	1,970,000	521,000	570,000

^PPreliminary.

¹Data are rounded to no more than three significant digits, may not add to totals shown.

²Includes industrial and laboratory chemicals, cosmetics, and pharmaceuticals.

TABLE 3
U.S. EXPORTS OF BISMUTH METAL, ALLOYS AND WASTE AND SCRAP, BY COUNTRY¹

(Kilograms, metal content)

Country	2006			2007		
	Year	December	Fourth quarter	January	February	First quarter ²
Argentina	9,400	--	--	--	--	--
Australia	20	20	20	--	--	--
Belgium	--	--	--	27,200	16,500	43,700
Brazil	20	--	--	--	3,630	3,630
Canada	72,100	10,300	17,000	17,600	591	18,200
Chile	916	--	--	--	--	--
Dominican Republic	42,200	556	2,740	714	856	1,570
Egypt	--	--	--	--	84	84
France	14,400	--	14,400	--	41	41
Germany	210	--	98	--	--	--
Hong Kong	5,740	--	27	--	--	--
India	164	--	--	--	--	--
Ireland	324	324	324	--	--	--
Israel	2,000	2,000	2,000	8,730	--	8,730
Japan	15,000	6,300	9,930	6,710	1,320	8,040
Korea, Republic of	309	50	50	--	--	--
Mexico	9,400	207	2,230	6,480	208	6,690
Morocco	717	717	717	--	--	--
Saudi Arabia	50	--	--	--	--	--
Singapore	29,300	5,010	28,700	2,420	282	2,700
Spain	115	--	--	--	--	--
Taiwan	2,030	285	2,030	--	--	--
Thailand	2,690	--	--	297	--	297
United Arab Emirates	--	--	--	12,400	--	12,400
United Kingdom	6,050	--	5,320	--	--	--
Vietnam	97,800	15,000	46,600	15,800	20,600	36,500
Total	311,000	40,800	132,000	98,500	44,100	143,000

-- Zero.

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

²Export data for March 2007 were not available at time of publication.

Source: U.S. Census Bureau.

TABLE 4
U.S. IMPORTS FOR CONSUMPTION OF BISMUTH METAL, BY COUNTRY¹

(Kilograms)

Country	2006			2007		
	Year	December	Fourth quarter	January	February	First quarter ²
Bahamas, The	1,080	--	--	--	--	--
Belgium	876,000	34,600	217,000	83,500	145,000	228,000
Canada	9,100	2,430	5,440	670	2,360	3,030
China	356,000	85,900	132,000	98,800	26,900	126,000
France	3	--	--	--	--	--
Germany	295	230	275	--	550	550
Hong Kong	74,600	--	--	--	--	--
Italy	380	--	80	--	150	150
Mexico	552,000	60,000	160,000	40,000	40,000	80,000
Netherlands	1,080	--	23	14	31	45
Peru	17,600	--	17,600	--	--	--
Spain	1,920	720	720	--	--	--
United Kingdom	406,000	26,800	165,000	5,000	23,200	28,200
Total	2,300,000	211,000	698,000	228,000	238,000	466,000

-- Zero.

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

²Import data for March 2007 were not available at time of publication.

Source: U.S. Census Bureau.