

Mineral Industry Surveys

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ZINC IN DECEMBER 2002

Estimated domestic mine production in December, at 67,200 metric tons (t), was about 5% more than in November and about 17% more than in December 2001. Smelter production, at 23,500 t, was 8% more than in November and about 28% more than it was a year before. Apparent consumption, at 89,100 t, was about 2% less than in November, but it was about 15% more than in December 2001.

The Platts Metals Week average monthly composite price for North American Special High Grade zinc increased by about 4%, to 39.69 cents per pound in December. Compared with December 2001, the price was about 6% higher.

According to an editorial in *Metal Bulletin*, the zinc industry needs a radical overhaul if prices are again to reach levels of \$1,000 per metric ton, not seen since early 2001. Consolidation of some major mining companies was viewed as a positive step for a fragmented zinc industry. A recent offer by Xstrata plc to buy MIM Holdings Ltd. is seen as an encouraging beginning. According to the editorial, the zinc industry also must find courage to close some of its unprofitable ventures, otherwise it will stay mired in its current predicament for some time to come (*Metal Bulletin*, 2002).

Despite marked improvement in the fourth quarter, ore production at Teck Cominco Ltd.'s Red Dog Mine in 2002 was about 1% lower compared with production in 2001. However, owing to an improved recovery rate, which rose to 84.5% from 78.9% in 2001, production of zinc in concentrate increased by

nearly 12%, to 578,400 t in 2002. Production at the Trail, British Columbia, smelter, at 269,000 t, was 60% higher than a year ago. Net earnings for the year were \$30 million, compared with a loss of \$21 million in 2001 (Teck Cominco Ltd., 2003).

Canada's OntZinc Ltd. signed a letter of intent to purchase the idled Balmat Mine in upstate New York owned by Zinc Corp. of America, subsidiary of Horsehead Industries Ltd., now in Chapter 11 bankruptcy protection. The purchase price is to be financed from future net profits. At the time of closure (May 2001), the Balmat Mine still had about 2 million metric tons (Mt) of proven and probable reserves grading 11.9% zinc, plus more than 3 Mt of indicated resources grading 12.9% zinc. The mill will probably be operated at no more than about 40% of its 4,500-metric-ton-per-day capacity.

Navan Mining plc's attempts to secure a bridging loan from Deutsche Bank, pending a proposed equity raising that would have ensured the survival of the company, proved unsuccessful. Navan undertook a restructuring at the beginning of 2002 in an attempt to rectify its worsening financial position following losses of \$83 million in 2001. It tried to sell its Aguas Teñidas and Sotiel polymetallic mines, but because of low metal prices, particularly zinc, it failed to find a buyer and suspended both operations. Navan's only operating asset is the Chelopech copper-gold mine in Bulgaria (*Mining Journal*, 2002b).

Exploration drilling by Arcon International Resources plc at its Galmoy base metal mine in Ireland intersected high-grade

Notice

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zinc-lead-silver mineralization. The highest grade ore in the new zone, located about 200 meters (m) from the orebody currently being exploited, contained 33.9% zinc, 22.6% lead, and 186 grams per ton silver. The average thickness of the recent intersection is 12.6 m, compared with the average width of the known orebody of 5.6 m. The new zone is open to the north and averages 27.9% zinc. This compares with the average of 12.8% at the current orebody (Mining Journal, 2002a).

MIM Holdings Ltd. of Australia announced that it was considering closure of the Avonmouth zinc smelter in the United Kingdom, operated by its subsidiary, Britannia Zinc Ltd. In the latest attempt to avoid closure, however, the company had put together an alternative proposal that will be examined during a 90-day discussion period between the company and the workers union. The consultation period should end by March 2003, but at present, it looks like the smelter will close. The cost of closure would total about \$46 million. The Avonmouth smelter produced 90,800 t of zinc and 34,700 t of lead bullion in 2001. For zinc production, it uses up to 65,000 t/yr of zinc concentrate and about 35,000 t/yr of secondary zinc, mainly Waelz zinc oxide, plus various residues and small quantities of flue dust. About one-half of the concentrate is sourced from MIM's own McArthur River Mine in Australia, while the rest comes from different sources including bulk concentrates from the Greens Creek Mine in Alaska. In anticipation of the smelter closure and the ensuing loss of a possible third consumer of its bulk concentrate (the Noyelles-Godault smelter in France has decided to convert to zinc recycling and the Duisburg smelter in Germany is also contemplating a switch), MIM is developing a new process to recover the zinc from the McArthur River concentrates (CRU International Ltd., 2003a). The new Albion process would treat the zinc/lead concentrate that currently can only be refined at plants employing the increasingly hard to find ISF (Imperial Smelting Furnace) extraction process. The Albion process first involves the ultra fine grinding of an ore or concentrate to increase the surface area of the particles making them more reactive. Grinding is followed by oxidative leaching in agitated tanks that removes lead from the concentrate. The rate of the reaction and the temperature, which is maintained at about 70°C, is controlled by the rate of oxygen flow. Following the leaching, the slurry is neutralized to precipitate impurities. The neutralized slurry is then thickened and filtered. The filtrate is processed via solvent extraction and electrowinning to recover zinc and separate copper sulfate and cadmium. In the pilot plant that has been in operation since May 2002, zinc recovery averaged around 96%. In early 2003, MIM will begin a full commercial-scale feasibility study, which is to be completed by yearend 2003 (CRU International Ltd., 2003b).

Update

The two largest shareholders in Mexico's Rey de Plata lead-zinc mine in Guerrero State have decided to permanently close the idled operation. Industrias Peñoles, S.A. de C.V. is the majority owner with 51%, followed by Dowa Mining Co. (39%) and Sumitomo Metal Mining Corp. (10%). Peñoles and Dowa believe that there is little chance that zinc prices will recover sufficiently to reopen the mine. The Rey de Plata Mine began operations in 1997 to supply lead concentrate to Peñoles and zinc concentrate to Akita Zinc Co. Ltd., a jointly owned Japanese smelter in which Dowa owns a majority share. The fall of zinc prices and strengthening of the peso compelled the partners to temporarily stop production in December 2001. As zinc prices did not improve, the temporary closure became permanent (Metal Bulletin, 2003).

The Noyelles-Godault smelter may close within months, as the French zinc producer Metaleurop SA has withdrawn financing for the loss-making plant. A few months earlier, the smelter had announced plans to convert to secondary zinc production. The announcement by Metaleurop that after January 17 no further financial assistance will be provided for its insolvent subsidiary—Metaleurop Nord, operator of the plant—arose the anger of the French Government, along with union members who are blocking the transportation of material out of the plant. The Government is threatening to take legal action to ensure that the company will be held liable for cleanup. After 110 years of zinc and lead production, the plant has left the site heavily polluted, which could cost the parent company up to \$324 million to clean up (Platts Metals Week, 2003).

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TABLE 1
SALIENT ZINC STATISTICS 1/

(Metric tons, unless otherwise specified)

	2002				
	2001	October	November	December	January- December
Production:					
Mine, zinc content of concentrate	842,000	70,800	63,900	67,200	783,000
Mine, recoverable zinc	799,000	68,300 r/	61,300 r/	64,700	754,000
Smelter, refined zinc	311,000	16,100	21,800	23,500	259,000
Consumption:					
Refined zinc, reported	543,000	36,100 r/	32,800 r/	33,400	415,000
Ores e/ (zinc content)	727	61	61	61	727
Zinc-base scrap e/ (zinc content)	191,000	15,900	15,900	15,900	189,000
Copper-base scrap e/ (zinc content)	176,000	14,700	14,700	14,700	176,000
Aluminum- and magnesium-base scrap e/ (zinc content)	1,430	120	120	120	1,430
Total e/	912,000	66,900 r/	63,500 r/	64,100	783,000
Apparent consumption, metal 2/	1,140,000	87,600	91,000 r/	89,100 3/	1,150,000
Stocks of refined (slab) zinc, end of period:					
Producer 4/	7,380	7,020	7,970	8,550	XX
Consumer 5/	57,100	58,000	57,400	59,100	XX
Merchant	10,300	10,800	11,300 r/	9,970	XX
Total	74,700	75,800	76,700 r/	77,600	XX
Shipments of zinc metal from Government stockpile					
	17,900	1,130	--	--	5,040
Imports for consumption:					
Refined (slab) zinc	813,000	69,800	66,500	NA	805,000 6/
Oxide (gross weight)	72,000	6,560	5,450	NA	64,000 6/
Ore and concentrate (zinc content)	84,000	5,010	12,500	NA	99,100 6/
Exports:					
Refined (slab) zinc	1,180	137	31	NA	1,070 6/
Oxide (gross weight)	11,300	878	969	NA	9,870 6/
Ore and concentrate (zinc content)	696,000	143,000	15,000	NA	799,000 6/
Waste and scrap (gross weight)	44,000	5,470	4,230	NA	43,400 6/
Price:					
London Metal Exchange, average, dollars per metric ton	\$885.43	\$754.30	\$764.91	\$797.36	\$778.38
Platts Metals Week North American Special High Grade, average, cents per pound	43.96	37.71	38.09	39.69	38.64

e/ Estimated. r/ Revised. NA Not available. XX Not applicable. -- Zero.

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

2/ Smelter production plus imports minus exports plus shipments from Government stockpile plus stock change.

3/ Data based on reported consumption, stocks, and estimated trade data.

4/ Data from U.S. Geological Survey and American Bureau of Metal Statistics.

5/ Includes an estimate for companies that report annually.

6/ Includes data through November only.

TABLE 2
REFINED ZINC PRODUCED IN THE UNITED STATES 1/

(Metric tons)

Month	Beginning stocks 2/	Production	Shipments	Ending stocks 2/
2001:				
December	7,210	19,400	19,300	7,380
Year	XX	311,000	311,000	XX
2002:				
January	7,380	24,600	21,200	10,800
February	10,800	25,600	25,400	11,000
March	11,000	22,700	24,000	9,760
April	9,760	23,400	23,800	9,420
May	9,420	23,900	25,800	7,470
June	7,470	23,700	24,500	6,670
July	6,670	19,100	18,900	6,830
August	6,830	16,200	16,000	7,010
September	7,010	17,900	17,400	7,470
October	7,470	16,100	16,600	7,020
November	7,020	21,800	20,800	7,970
December	7,970	23,500	22,900	8,550
January-December	XX	259,000	257,000	XX

XX Not applicable.

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

2/ Includes stocks held at locations other than smelters.

Sources: U.S. Geological Survey and American Bureau of Metal Statistics.

TABLE 3
APPARENT CONSUMPTION OF REFINED ZINC ACCORDING TO
INDUSTRY USE AND PRODUCT 1/

(Metric tons)

Industry and product	2001	2002			January-December
		October	November	December 2/	
Galvanizing:					
Sheet and strip	432,000	37,300 r/	37,600 r/	38,400	477,000
Other	146,000	12,200 r/	13,500	12,900	175,000
Total	578,000	49,500 r/	51,100 r/	51,300	652,000
Brass and bronze	148,000	14,200 r/	15,000 r/	14,000	189,000
Zinc-base alloy	190,000	18,700 r/	19,800 r/	19,200	233,000
Other uses 3/	226,000	5,300 r/	5,100 r/	4,600	71,700
Grand total	1,140,000	87,600	91,000	89,100	1,150,000

r/ Revised.

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

2/ Data based on reported consumption, stocks and estimated trade data.

3/ Includes zinc used in making zinc dust, desilvering lead, powder, alloys, anodes, chemicals, castings, light metal alloys, rolled zinc, and miscellaneous uses not elsewhere specified.

TABLE 4
AVERAGE MONTHLY ZINC PRICES 1/

Period	North American		\$/t
	¢/lb.	LME cash ¢/lb.	
2001:			
December	37.48	34.21	754.28
Year	43.96	40.16	885.43
2002:			
January	39.23	35.96	792.86
February	38.23	34.97	770.86
March	40.30	37.15	818.96
April	39.89	36.64	807.80
May	38.16	34.89	769.19
June	38.04	34.78	766.75
July	39.30	36.04	794.45
August	37.27	33.89	747.24
September	37.81	34.29	755.88
October	37.71	34.21	754.30
November	38.09	34.70	764.91
December	39.69	36.17	797.36
January-December	38.64	35.31	778.38

1/ Special High Grade.

Source: Platts Metals Week.

TABLE 5
U.S. EXPORTS OF ZINC 1/

Material	2001		2002 2/			
	Quantity (metric tons)	Value (thousands)	November		Year to date	
			Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Refined (slab) zinc	1,180	\$1,290	31	\$42	1,070	\$1,040
Ore and concentrate (zinc content)	696,000	285,000	15,000	3,350	799,000	317,000
Waste and scrap (gross weight)	44,000	22,800	4,230	2,020	43,400	21,000
Powders, flakes, dust (zinc content)	4,690	7,230	602	730	4,720	6,990
Oxide (gross weight)	11,300	17,600	969	1,340	9,870	13,400
Chloride (gross weight)	1,730	1,630	84	94	1,700	1,780
Sulfate (gross weight)	4,780	2,900	270	145	2,750	1,670
Compounds, other (gross weight)	227	499	8	66	192	493

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

2/ Data for December 2002 were not available at time of publication.

Source: U.S. Census Bureau.

TABLE 6
U.S. IMPORTS FOR CONSUMPTION OF ZINC 1/

Material	2001		2002 2/			
	Quantity (metric tons)	Value (thousands)	November		Year to date	
			Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Refined (slab) zinc	813,000	\$773,000	66,500	\$52,700	805,000	\$660,000
Ore and concentrate (zinc content)	84,000	31,600	12,500	4,440	99,100	36,500
Waste and scrap (gross weight)	39,300	11,600	2,230	644	27,400	8,610
Powders, flakes, dust (zinc content)	26,700	45,000	2,610	3,980	28,700	44,800
Oxide (gross weight)	72,000	66,200	5,450	4,480	64,000	52,900
Chloride (gross weight)	946	1,020	107	115	676	702
Sulfate (gross weight)	16,200	7,330	1,720	930	17,700	9,090
Compounds, other (gross weight)	1,400	1,360	34	61	925	1,050

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

2/ Data for December 2002 were not available at time of publication.

Source: U.S. Census Bureau.

TABLE 7
SHIPMENTS OF ZINC METAL FROM THE NATIONAL DEFENSE
STOCKPILE 1/

(Metric tons)

Period	Beginning inventory	Shipments	Ending inventory
2001:			
December	120,000	100	120,000
Year	XX	17,900	XX
2002:			
January	114,000	220	114,000
February	114,000	--	114,000
March	114,000	202	113,000
April	113,000	197	113,000
May	113,000	1,220	112,000
June	112,000	741	111,000
July	111,000	890	110,000
August	110,000	445	110,000
September	110,000	--	110,000
October	110,000	1,130	109,000
November	109,000	--	109,000
December	109,000	--	109,000
January-December	XX	5040	XX

XX Not applicable. -- Zero.

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

Source: Defense Logistics Agency.

TABLE 8
U.S. IMPORTS OF ZINC, BY TYPE OF MATERIAL AND COUNTRY 1/ 2/

(Metric tons)

Material and country	General imports			Imports for consumption		
	2001	2002 2/		2001	2002 2/	
		November	Year to date		November	Year to date
Ore and concentrate (zinc content):						
Australia	17,200	5,850	36,500	17,200	5,850	36,500
Mexico	10,700	3,330	12,700	10,700	3,330	12,700
Peru	54,900	--	43,300	54,900	--	43,300
Other	1,150	3,310	6,690	1,150	3,310	6,690
Total	84,000	12,500	99,100	84,000	12,500	99,100
Blocks, pigs, or slab:						
Australia	55,700	--	35,000	29,600	--	21,000
Brazil	17,900	--	22,600	17,900	--	22,600
Canada	442,000	43,300	476,000	438,000	43,300	476,000
Chile	--	--	3,750	--	--	--
China	31,800	3,010	39,700	7,260	--	1,030
Japan	7,280	--	10,500	274	--	--
Kazakhstan	88900	10,900	93,200	88900	10,900	93,200
Korea, Republic of	30,600	--	73200	10,800	--	2,480
Mexico	141,000	7,710	125,000	140,000	7,710	125,000
Peru	48,800	3,660	35,400	47,600	3,660	33,400
Poland	8,530	--	7,740	8,530	--	7,740
Russia	14,400	631	10700	14,400	631	10,700
Other	16,100	324	19,400	10,100	324	12,500
Total	903,000	69,500	952,000	813,000	66,500	805,000
Dross, ashes, fume (zinc content)						
	12,000	1,460	14,200	12,000	1,460	14,200
Grand total	999,000	83,500	1,060,000	909,000	80,500	918,000
Oxide (gross weight):						
Canada	47,500	3,850	41,400	47,500	3,850	41,400
China	227	40	838	227	40	838
Japan	1,110	80	774	1,110	80	774
Mexico	18,900	1,380	18,000	18,900	1,380	18,000
Netherlands	2820	73	2300	2820	73	2300
Other	1,390	30	698	1,390	30	698
Total	72,000	5,450	64,000	72,000	5,450	64,000
Other (gross weight):						
Waste and scrap	39,300	2,230	27,400	39,300	2,230	27,400
Sheets	7,240	51	1,470	7,240	51	1,470
Powders, flakes, dust (zinc cont	26,700	2,610	28,700	26,700	2,610	28,700

-- Zero.

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

2/ Data for December 2002 were not available at time of publication.

Source: U.S. Census Bureau.