

# Mineral Industry Surveys

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## ZINC IN DECEMBER 2015

Domestic mine production (recoverable) of zinc in December 2015 was 55,900 metric tons (t) (table 2). Average daily mine production in December was 1,800 t, 9% less than that in November and 26% less than that in December 2014. Average daily mine production generally decreased in the second half of 2015 (fig. 1). Recoverable zinc mine production in 2015 was 779,000 t, 3% less than that in 2014 owing mostly to decreased output at Teck Resources Ltd.'s (Canada) Red Dog zinc-lead mine in Alaska. Teck reported that zinc production at Red Dog fell by 5% in 2015 from that of 2014 to 567,000 t owing to extended mill downtime to perform maintenance work in the third and fourth quarters. The company projected that Red Dog's zinc production would continue to decline during the next few years as a result of decreasing ore grades at the deposit; zinc production was forecast to range from 545,000 t to 570,000 t in 2016 and 500,000 metric tons per year (t/yr) to 550,000 t/yr from 2017 through 2019 (Teck Resources Ltd., 2015, p. 18; 2016, p. 20, 37).

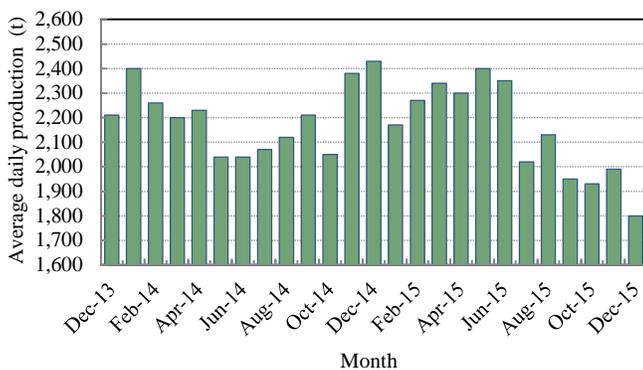


Figure 1. Average daily domestic zinc mine production (recoverable) from December 2013 through December 2015. Source: U.S. Geological Survey.

Zinc metal production decreased by 4% in 2015 from that of 2014 to 172,000 t; increased production at Nyrstar NV's (Belgium) zinc smelter in Clarksville, TN, was more than offset by decreased production at Horsehead Holding Corp.'s (Pittsburgh, PA) facilities. Horsehead closed its Monaca, PA,

electrothermic zinc smelter in April 2014 and subsequently began operations at its new Mooresboro, NC, zinc solvent-extraction/electrowinning facility. Mooresboro was unable to ramp up to full design production capacity in 2015 owing to several technical issues.

Global London Metal Exchange Ltd. (LME) stocks of Special High Grade (SHG) zinc decreased by 79,900 t to 462,700 t in December 2015 owing mostly to a 67,650 t decrease in stocks held in New Orleans, LA. By yearend 2015, SHG zinc stocks had decreased by 228,125 t from yearend 2014 (fig. 2, table 7).

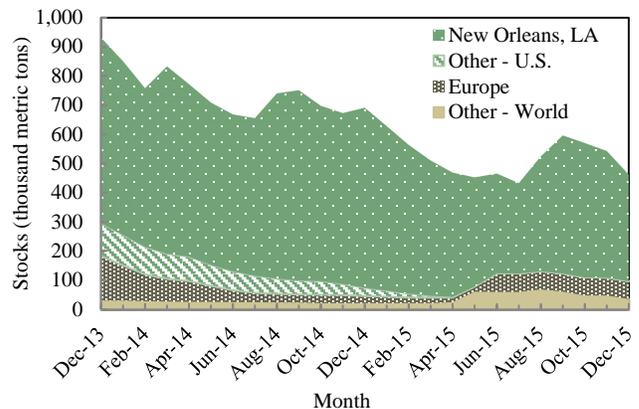


Figure 2. Global LME stocks of SHG zinc, monthend, from December 2013 through December 2015. Source: London Metal Exchange Ltd.

The monthly average Platts Metals Week North American SHG zinc price for December 2015 was 76.04 cents per pound, 4% less than that in November and 29% less than that in December 2014; the average annual price for 2015 was 95.54 cents per pound, 11% less than that of 2014. The December average LME cash price for SHG zinc was \$1,521.74 per metric ton, 4% less than that in the previous month and 30% less than that in December 2014; the average annual price for 2015 was \$1,932.14 per metric ton, 11% less than that of 2014. The North American premium to the LME price in December averaged

about 7 cents per pound, 4% less than that in November (fig. 3, table 6).

### Update

In late January, The Doe Run Company (St. Louis, MO) announced that it planned to decrease its lead in concentrate production at its Southeast Missouri Mining and Milling Division (SEMO) operations by 10% in 2016. The SEMO mines produced copper and zinc as byproducts of lead mining (Doe Run Company, The, 2016).

In March, Steel Dust Recycling LLC (SDR, Millport, AL) announced that it planned to add a third Waelz kiln at its recycling plant in Millport, AL, expanding the plant's electric arc furnace (EAF) dust recycling capacity by 99,800 t/yr to a total capacity of 308,000 t/yr. EAF dust is a waste product recovered from the air emissions from smelting steel scrap and typically contains 10% to 20% zinc. SDR recycles EAF dust to produce Waelz zinc oxide (or crude zinc oxide), which is then used as a feed material for the production of SHG zinc, zinc sulfate, and zinc oxide (Steel Dust Recycling LLC, 2016).

In October 2015, Star Mountain Resources, Inc. (Littleton, CO) entered into a three-way definitive agreement with HudBay Minerals, Inc. (Canada) and Northern Zinc, LLC (Carson City, NV) to purchase the Balmat mining operations in St. Lawrence County, New York (See Zinc in August 2015). In January, Star Mountain released reserve estimates for the Balmat zinc mine. As of December 1, 2015, reported proven and probable reserves (compliant with the United States Securities and Exchange Commission's Industry Guide 7) at Balmat contained 48,800 t of zinc. The current production plan assumed 1 year of pre-

production and 1.5 years of production. Mineralization not currently classified as reserves may support an additional 6 years of production (Practical Mining LLC, 2016, p. 17, 115).

### References Cited

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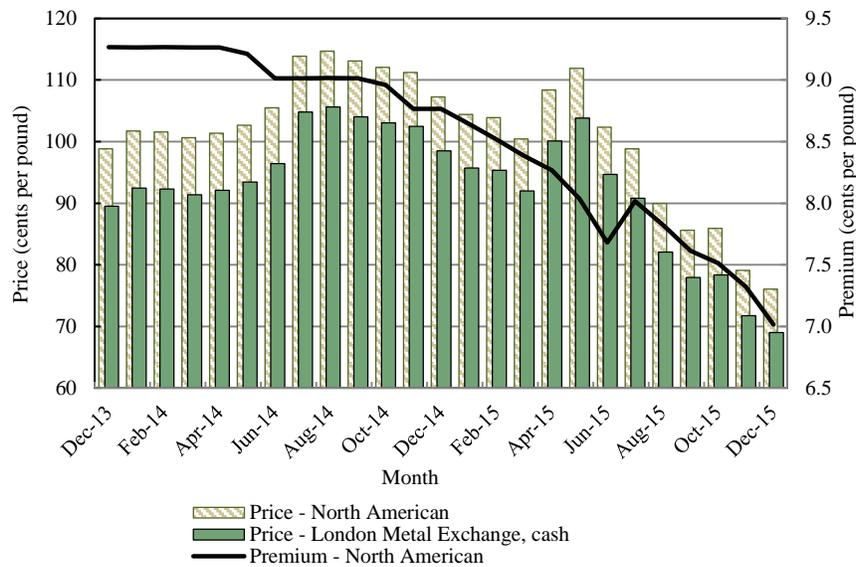


Figure 3. Average monthly prices and premium for SHG zinc from December 2013 through December 2015. North American price is based on the LME cash price plus premium. Source: Platts Metals Week.

TABLE 1  
SALIENT ZINC STATISTICS<sup>1</sup>

(Metric tons, unless otherwise specified)

	2014	2015		
	January– December <sup>p</sup>	November	December	January– December
<b>Production:</b>				
Mine, zinc content of concentrate <sup>2</sup>	832,000	61,700 <sup>r</sup>	57,900	806,000
Mine, recoverable zinc <sup>2</sup>	803,000	59,600 <sup>r</sup>	55,900	779,000
Smelter, refined zinc <sup>c</sup>	180,000	14,400 <sup>r</sup>	13,500	172,000
Consumption of refined zinc, apparent <sup>3</sup>	965,000	70,400 <sup>r</sup>	68,500	931,000
<b>Imports for consumption:</b>				
Ore and concentrate (zinc content)	2	--	--	22
Refined zinc	805,000	56,300	56,200	771,000
<b>Exports:</b>				
Ore and concentrate (zinc content)	644,000	20,900	4,570	708,000
Refined zinc	19,800	291	1,130	12,700
<b>Price:<sup>4</sup></b>				
London Metal Exchange cash, average, dollars per metric ton	2,161.67	1,581.96	1,521.74	1,932.14
Platts Metals Week North American, average, cents per pound	107.12	79.08	76.04	95.54

<sup>c</sup>Estimated. <sup>p</sup>Preliminary. <sup>r</sup>Revised. -- Zero.

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

<sup>2</sup>Reported zinc content in both zinc and lead concentrates.

<sup>3</sup>Smelter production plus imports for consumption minus domestic exports.

<sup>4</sup>Special High Grade Zinc.

TABLE 2  
MINE AND SMELTER PRODUCTION OF ZINC  
IN THE UNITED STATES<sup>1</sup>

(Metric tons)

Period	Mine <sup>2</sup>		Smelter <sup>c</sup>
	Zinc content	Recoverable	
<b>2014:</b>			
December	77,800	75,200	15,700
January–December	832,000	803,000	180,000
<b>2015:</b>			
January	69,600	67,300	16,300
February	65,800	63,600	14,400
March	74,900	72,400	14,500
April	71,200	68,900	14,000
May	76,900	74,500	15,200 <sup>r</sup>
June	72,800	70,400	14,800
July	64,700	62,500	14,400
August	68,200	65,900	13,700
September	60,500	58,400	13,500
October	62,000 <sup>r</sup>	59,900 <sup>r</sup>	13,400 <sup>r</sup>
November	61,700 <sup>r</sup>	59,600 <sup>r</sup>	14,400 <sup>r</sup>
December	57,900	55,900	13,500
January–December	806,000	779,000	172,000

<sup>c</sup>Estimated. <sup>r</sup>Revised.

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

<sup>2</sup>Includes the zinc content in both lead and zinc concentrates.

TABLE 3  
U.S. IMPORTS FOR CONSUMPTION OF ZINC<sup>1</sup>

(Gross weight, unless otherwise specified)

Material	2014		2015			
	Quantity (metric tons)	Value (thousands)	December		January–December	
			Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Ore and concentrate (zinc content)	2	\$4	--	--	22	\$48
Unwrought:						
Refined zinc	805,000	1,760,000	56,200	\$96,300	771,000	1,620,000
Zinc alloys	7,930	17,800	742	1,290	8,070	17,100
Wrought:						
Bars, rods, profiles, wire	2,600	8,210	246	796	3,020	9,590
Plates, sheets, strip, foil	4,090	15,400	249	948	3,680	14,600
Other:						
Dross, ashes, fume (zinc content)	8,590	12,200	353	561	5,610	8,350
Powders, flakes, dust	31,700	103,000	1,740	5,200	29,100	91,400
Waste and scrap	24,900	30,900	1,260	1,250	18,000	20,100
Chemicals:						
Oxide	125,000	272,000	8,040	15,400	116,000	250,000
Chloride	149	1,270	10	84	156	1,170
Sulfate	83,600	60,800	7,260	5,140	88,800	68,100
Compounds, other <sup>2</sup>	4,180	12,200	135	763	3,800	11,900

-- Zero.

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

<sup>2</sup>Includes zinc sulfide (HTS 2830.90.1000 and 2830.90.1500), chromates of zinc or of lead (HTS 2841.90.4500), and lithopone and other pigments and preparations based on zinc sulfide (HTS 3206.42.0000).

Source: U.S. Census Bureau, U.S. International Trade Commission.

TABLE 4  
U.S. IMPORTS OF ZINC, BY TYPE OF MATERIAL AND COUNTRY<sup>1</sup>

(Metric tons, gross weight, unless otherwise specified)

Material and country	General imports			Imports for consumption		
	2014	2015		2014	2015	
		December	January–December		December	January–December
<b>Ore and concentrate (zinc content):</b>						
Canada	--	--	19	--	--	19
Germany	--	--	3	--	--	3
Mexico	2	--	--	2	--	--
Total	2	--	22	2	--	22
<b>Refined zinc:</b>						
Australia	46,000	24	45,100	115,000	464	82,400
Austria	--	--	--	557	--	--
Belgium	--	--	1,250	14,500 <sup>r</sup>	38	19,600
Brazil	--	--	--	6,590	--	99
Canada	444,000	41,700	479,000	444,000	41,700	479,000
China	56 <sup>r</sup>	--	64	658	--	1,800
India	--	--	2,500	--	--	2,500
Italy	18	--	--	18	--	--
Korea, Republic of	--	--	1,500	37,900	2,990	20,900
Mexico	103,000	8,740	99,000	104,000	8,740	99,000
Netherlands	--	--	--	1,320 <sup>r</sup>	3	2,840
Peru	46,400	2,200	31,200	46,400	2,200	31,200
Spain	--	--	31	34,100	42	32,000
Switzerland	--	--	--	--	28	28
Taiwan	81	2	30	81	2	32
United Kingdom	--	--	--	--	--	49
Other	1	--	(2)	1	--	(2)
Total	639,000	52,600	659,000	805,000	56,200	771,000
<b>Oxide:</b>						
Australia	302	(2)	26	302	(2)	26
Belgium	821	5	155	818	5	155
Canada	76,400	4,580	71,200	76,400	4,580	71,200
China	390	49	585	390	49	580
Congo (Kinshasa)	1,440	--	--	1,440	--	--
Germany	2,750 <sup>r</sup>	263	2,380	2,750 <sup>r</sup>	263	2,380
India	492	--	202	492	--	202
Indonesia	185	--	1	185	--	1
Israel	24	--	--	24	--	--
Japan	1,030 <sup>r</sup>	30	485	1,030 <sup>r</sup>	30	485
Malaysia	234	--	--	234	--	--
Mexico	34,000	2,470	32,500	34,000	2,470	32,500
Netherlands	4,540	484	5,790	4,540	484	5,790
Norway	--	--	5	--	--	5
Peru	2,210	89	1,510	2,210	89	1,510
Sri Lanka (Ceylon)	60	--	--	60	--	--
Switzerland	(2)	--	21	(2)	--	21
Taiwan	25	--	--	25	--	--
Trinidad and Tobago	68	--	--	68	--	--
Turkey	403	40	417	403	40	417
United Kingdom	26	32	232	26	32	232
Other	8	--	(2)	8	--	(2)
Total	125,000	8,040	116,000	125,000 <sup>r</sup>	8,040	116,000

<sup>r</sup>Revised. -- Zero.

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

<sup>2</sup>Less than ½ unit.

Source: U.S. Census Bureau, U.S. International Trade Commission.

TABLE 5  
U.S. EXPORTS OF ZINC<sup>1</sup>

(Gross weight, unless otherwise specified)

Material	2014		2015			
	Quantity (metric tons)	Value (thousands)	December		January–December	
			Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Ore and concentrate (zinc content)	644,000	\$1,120,000	4,570	\$5,370	708,000	\$987,000
Unwrought:						
Refined zinc	19,800	37,300	1,130	1,800	12,700	29,000
Zinc alloys	27,100	69,800	1,130	2,690	19,700	50,600
Wrought:						
Bars, rods, profiles, wire	10,000	19,300	861	1,240	15,400	25,000
Plates, sheets, strip, foil	6,710	24,400	1,680	4,250	8,010	28,000
Other:						
Dross, ashes, fume (zinc content)	27,400	45,700	3,560	3,600	29,300	37,600
Powders, flakes, dust	10,400	32,200	1,150	3,640	12,300	38,700
Waste and scrap	71,400	93,700	2,740	3,100	55,200	68,600
Chemicals:						
Oxide	6,160	20,800	4,840	3,380	21,800	29,100
Chloride	681	1,000	57	85	421	662
Sulfate	628	612	98	98	726	751
Compounds, other <sup>2</sup>	2,210	24,300	104	1,960	1,840	21,900

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

<sup>2</sup>Includes zinc sulfide (Schedule B 2830.90.1000 and 2830.90.1500), chromates of zinc or of lead (Schedule B 2841.90.4500), and lithopone and other pigments and preparations based on zinc sulfide (Schedule B 3206.42.0000).

Source: U.S. Census Bureau, U.S. International Trade Commission.

TABLE 6  
AVERAGE PRICES FOR SPECIAL HIGH GRADE ZINC

Period	North	London Metal Exchange	
	American <sup>1</sup> ¢/lb.	cash <sup>2</sup> ¢/lb.	\$/t
2014:			
December	107.26	98.49	2,171.36
January–December	107.12	98.05	2,161.67
2015:			
January	104.37	95.72	2,110.32
February	103.90	95.38	2,102.74
March	100.40	92.02	2,028.60
April	108.35	100.09	2,206.51
May	111.87	103.83	2,289.13
June	102.35	94.67	2,087.05
July	98.81	90.80	2,001.69
August	89.91	82.08	1,809.61
September	85.57	77.96	1,718.64
October	85.88	78.37	1,727.73
November	79.08	71.76	1,581.96
December	76.04	69.02	1,521.74
January–December	95.54	87.64	1,932.14

<sup>1</sup>Platts Metals Week North American price. Based on the London Metal Exchange cash price plus premium.

<sup>2</sup>Average of the cash buyer price and the cash seller and settlement price.

Source: Platts Metals Week.

TABLE 7  
LONDON METAL EXCHANGE (LME) STOCKS OF SPECIAL HIGH GRADE ZINC, END OF PERIOD

(Metric tons)

Period	United States			Europe	Other	Total LME
	Detroit, MI	New Orleans, LA	Total			
2014:						
December	28,850	616,500	645,350	23,000	22,475	690,825
2015:						
January	20,575	564,150	584,725	21,175	22,175	628,075
February	11,925	510,300	522,225	20,150	21,800	564,175
March	6,775	463,525	470,300	18,825	21,500	510,625
April	325	425,250	425,575	18,425	24,425	468,425
May	250	373,725	373,975	18,125	60,475	452,575
June	250	341,550	341,800	63,975	59,850	465,625
July	250	310,025	310,275	63,000	59,525	432,800
August	25	394,175	394,200	62,325	68,400	524,925
September	25	473,100	473,125	62,100	60,800	596,025
October	25	460,050	460,075	62,000	47,875	569,950
November	25	433,375	433,400	61,450	47,750	542,600
December	25	365,725	365,750	61,250	35,700	462,700

Source: London Metal Exchange, Ltd.