

# Mineral Industry Surveys

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## ZINC IN SEPTEMBER 2023

Domestic mine production (recoverable) of zinc in September 2023 was 56,800 metric tons (t) (tables 1, 2). Mine production (recoverable) for the year through September was 543,000 t, 7% less than that in the same period in 2022. Average daily (recoverable) mine production in September was 1,890 t, 17% more than that in the previous month but 9% less compared with that in September 2022 (fig. 1, table 2).

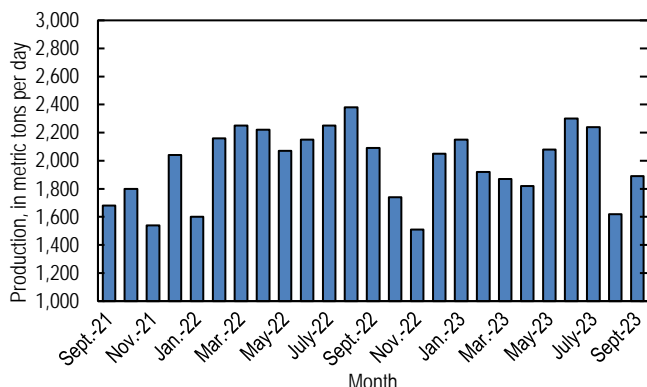


Figure 1. Average daily domestic zinc mine production (recoverable) from September 2021 through September 2023.

## Stocks and Prices

There were no London Metal Exchange Ltd. (LME) stocks of Special High Grade (SHG) zinc held in U.S. warehouses at the end of September 2023, unchanged since the end of January 2023 and down from 1,725 t at the end of September 2022. Global LME stocks were 102,775 t at the end of September 2023, 33% less compared with stocks at the end of August 2023 but almost double those at the end of September 2022 (fig. 2, table 9). Reported off-warrant stocks of SHG zinc in LME-approved warehouses at the end of September 2023 increased to 49,684 t from 14,840 t at the end of August 2023; of which 98% were held in Asia and 2% in Europe (London Metal Exchange Ltd., 2023).

The monthly average S&P Global Platts Metals Week North American SHG zinc price in September 2023 was 142 cents per pound, 3% more than that in the previous month but 22% less than that in September 2022. The September 2023

average LME cash price for SHG zinc was \$2,487.75 per metric ton (113 cents per pound), 4% more than that in the previous month but 21% less than that in September 2022 (fig. 3, table 8).

The North American premium to the LME cash price in September 2023 averaged 29 cents per pound, essentially unchanged from that in the previous month and 25% less compared with that in September 2022 (fig. 3, table 8).

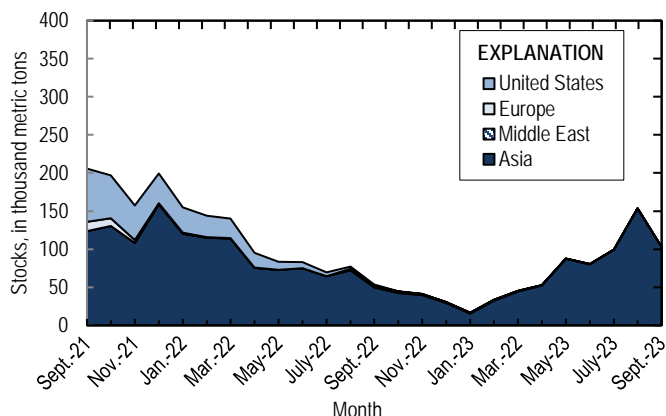


Figure 2. Global LME stocks of Special High Grade zinc, end of month, from September 2021 through September 2023. Source: London Metal Exchange Ltd.

## Domestic news

The U.S. Government continued to fund the development of zinc-bromine batteries for renewable energy storage. Redflow Ltd. (Australia) signed a contract with the U.S. Department of Defense to install zinc-bromine batteries at an existing microgrid installation to extend the duration of renewable energy storage. Separately, the company received funding from the U.S. Department of Energy (DOE) to provide batteries for a microgrid project in California as part of larger DOE program aimed at advancing the adoption of clean energy technology (Redflow Ltd., 2023a, b).

## World news

Aeris Resources Ltd. (Australia) placed the Jaguar zinc-copper mine in Australia on care-and-maintenance status owing to a combination of operational issues, decreasing zinc prices,

and cost inflation. The company projected that the mine would remain on care-and-maintenance status through at least the end of the fiscal year ending June 30, 2024, during which time, Aeris would complete feasibility work on restart options. About 22,500 t of zinc in concentrate were produced at the Jaguar Mine in the fiscal year ending June 30, 2023 (Aeris Resources Ltd., 2023).

Almina-Minas do Alentejo S.A. (Portugal) suspended production at the Aljustrel zinc-lead mine in Portugal because of low zinc prices. The suspension began September 24 and would last until the second quarter of 2025. The mine reportedly produced 215,000 t of zinc concentrate (Desai, 2023). The zinc content of zinc concentrate typically ranges between 46% and 56%.

## References Cited

- Aeris Resources Ltd., 2023, Corporate update and FY24 guidance: Brisbane, Queensland, Australia, Aeris Resources Ltd., August 2, 10 p. (Accessed August 2, 2023, via <https://www.aerisresources.com.au/investor-centre/#asx-announcements>.)
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- London Metal Exchange Ltd., 2023, Off-warrant stock reporting: London, United Kingdom, London Metal Exchange Ltd. (Accessed November 16, 2023, via <https://www.lme.com/en/Market-data/Reports-and-data/Warehouse-and-stocks-reports/Off-warrant-stock-reporting>.)
- Redflow Ltd., 2023a, Redflow and Ameresco to deploy microgrid for United States Department of Defense: Brisbane, Queensland, Australia, Redflow Ltd., September 19. (Accessed September 19, 2023, at <https://redflow.com/project/redflow-and-ameresco-to-deploy-microgrid-for-united-states-department-of-defense>.)
- Redflow Ltd., 2023b, Redflow awarded funding from U.S. Department of Energy for 34.4 MWh energy storage project: Brisbane, Queensland, Australia, Redflow Ltd., September 25. (Accessed September 25, 2023, at <https://redflow.com/project/redflow-awarded-funding-from-u-s-department-of-energy-for-34-4-mwh-energy-storage-project>.)

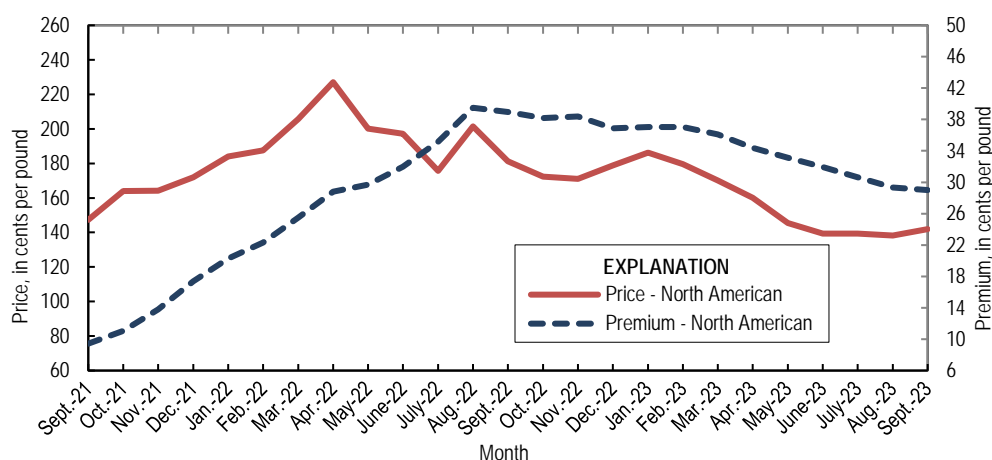


Figure 3. Average monthly North American price and premium for Special High Grade zinc from September 2021 through September 2023. The North American price is based on the London Metal Exchange cash price plus the North American premium. Source: S&P Global Platts Metals Week.

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

(Metric tons, unless otherwise specified)

	2022	2023		
	January– December <sup>p</sup>	August	September	January– September <sup>2</sup>
Production:				
Mine, zinc content of concentrate <sup>3</sup>	761,000	51,300	58,100	556,000
Mine, recoverable zinc <sup>3</sup>	744,000	50,100	56,800	543,000
Smelter, refined zinc <sup>e,4</sup>	220,000	18,000	18,000	162,000
Consumption of refined zinc, apparent <sup>5</sup>	974,000	67,200	65,900	717,000
Imports for consumption:				
Ore and concentrate (zinc content)	4,870	413	246	15,500
Refined zinc	762,000	49,300	48,100	559,000
Exports:				
Ore and concentrate (zinc content)	644,000	187,000	129,000	546,000
Refined zinc	8,070	108	155	3,720
Price: <sup>6</sup>				
London Metal Exchange cash, average, dollars per metric ton	3,484.42	2,400.48	2,487.75	2,698.69
North American, <sup>7</sup> average, cents per pound	190.19	138.23	141.86	155.59

<sup>e</sup>Estimated. <sup>p</sup>Preliminary.

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

<sup>2</sup>May include revisions to previously published data.

<sup>3</sup>Reported zinc content in both zinc and lead concentrates.

<sup>4</sup>Monthly and annual smelter production data are estimated to avoid disclosing company proprietary data and do not reflect actual production reported to the U.S. Geological Survey.

<sup>5</sup>Smelter production plus imports for consumption minus domestic exports. Apparent consumption may not reflect actual consumption owing to significant changes in unreported stocks.

<sup>6</sup>Special High Grade Zinc.

<sup>7</sup>S&P Global Platts Metals Week.

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

(Metric tons)

Period	Mine <sup>2</sup>		Smelter <sup>e, 3</sup>
	Zinc content	Recoverable	
2022:			
September	64,100	62,700	18,000
October	55,300	54,000	18,000
November	46,400	45,400	18,000
December	64,900	63,500	18,000
January–December	761,000	744,000	220,000
2023:			
January	68,300	66,800	18,000
February	55,200	53,900	18,000
March	59,500	58,100	18,000
April	55,900	54,600	18,000
May	65,900	64,500	18,000
June	70,700	69,100	18,000
July	71,500	69,400	18,000
August	51,300	50,100	18,000
September	58,100	56,800	18,000
January–September	556,000	543,000	162,000

<sup>e</sup>Estimated.

<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.

<sup>3</sup>Monthly and annual smelter production data are estimated to avoid disclosing company proprietary data and do not reflect actual production reported to the U.S. Geological Survey.

TABLE 3  
U.S. SHIPMENTS OF  
GALVANIZED STEEL SHEET AND STRIP<sup>1</sup>

Period	Quantity (metric tons)
2022:	
September	1,310,000
October	1,350,000
November	1,320,000
December	1,250,000
January–September	12,400,000
January–December	16,300,000
2023:	
January	1,290,000
February	1,280,000
March	1,380,000
April	1,410,000
May	1,440,000
June	1,410,000
July	1,360,000
August	1,410,000
September	1,280,000
January–September	12,200,000

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

Source: American Iron and Steel Institute.

TABLE 4  
U.S. IMPORTS FOR CONSUMPTION OF ZINC<sup>1</sup>

(Gross weight, unless otherwise specified)

Material	2022		2023			
	Quantity (metric tons)	Value (thousands)	September		January–September <sup>2</sup>	
			Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Ore and concentrate (zinc content)	4,870	\$9,880	246	\$221	15,500	\$16,600
Unwrought:						
Refined zinc	762,000	2,710,000	48,100	139,000	559,000	1,810,000
Zinc alloys	3,770	15,200	426	1,220	3,590	12,700
Wrought:						
Bars, rods, profiles, wire	3,500	16,200	332	1,350	3,070	12,600
Plates, sheets, strip, foil	1,680	9,840	208	1,320	1,190	6,990
Ash and residues: <sup>3</sup>						
Hard zinc spelter	--	--	--	--	(4)	22
Zinc dross and skimmings	4,370	8,550	337	560	4,690	7,590
Other (zinc content)	5,610	12,000	14	34	1,600	1,130
Other:						
Powders, flakes, dust	19,800	92,600	1,260	5,190	12,100	53,900
Waste and scrap	10,900	23,300	690	1,350	8,150	16,800
Chemicals:						
Lithopone	1,110	4,520	20	175	218	979
Zinc chloride	419	2,830	69	440	455	2,450
Zinc oxide	104,000	371,000	8,070	23,800	73,600	239,000
Zinc sulfate	95,200	124,000	7,470	6,840	49,400	47,000
Zinc sulfide	1,930	9,710	100	669	1,620	9,450

-- Zero.

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

<sup>2</sup>May include revisions to previously published data.

<sup>3</sup>Other than from the manufacture of iron and steel; containing mainly zinc.

<sup>4</sup>Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 5  
U.S. IMPORTS OF ZINC, BY TYPE OF MATERIAL AND COUNTRY OR LOCALITY<sup>1</sup>

(Metric tons, gross weight, unless otherwise specified)

Material and country or locality	General imports			Imports for consumption		
	2022	2023		2022	2023	
		September	January–September <sup>2</sup>		September	January–September <sup>2</sup>
Ore and concentrate (zinc content):						
Canada	1,610	246	1,650	1,610	246	1,650
China	358	--	--	358	--	--
Korea, Republic of	--	--	3,860	--	--	3,860
Peru	2,670	--	--	2,670	--	--
Turkey	--	--	9,950	--	--	9,950
Other	232	--	9	232	--	9
Total	4,870	246	15,500	4,870	246	15,500
Refined zinc:						
Australia	69,000	--	39,700	74,000	--	39,700
Belgium	--	59	227	1,800	59	227
Brazil	--	3,000	21,900	10	3,000	21,900
Bulgaria	--	--	43	--	--	43
Canada	378,000	31,600	263,000	378,000	31,600	263,000
China	(3)	66	1,970	502	66	1,970
Denmark	(3)	--	--	(3)	--	--
Germany	983	--	10	983	--	10
India	--	--	4,920	--	--	4,920
Italy	3	--	2	3	--	2
Japan	2	39	1,730	2	39	1,730
Kazakhstan	17,700	--	39,400	17,700	--	39,400
Korea, Republic of	88,600	1,500	47,000	94,000	1,500	47,000
Luxembourg	--	--	75	--	--	75
Mexico	108,000	6,760	83,200	108,000	6,760	83,200
Netherlands	--	--	--	1,240	--	--
Nigeria	320	--	--	320	--	--
Peru	52,900	5,040	53,500	52,900	5,040	53,500
Poland	241	--	780	241	--	780
Singapore	21	--	25	21	--	25
Spain	5,500	--	--	31,600	--	--
Taiwan	21	--	9	21	--	9
Thailand	(3)	--	--	(3)	--	--
United Kingdom	20	--	1,640	20	--	1,640
Total	722,000	48,100	559,000	762,000	48,100	559,000
Oxide:						
Australia	197	99	376	148	99	401
Canada	44,200	2,740	27,100	44,200	2,740	27,100
China	800	17	137	800	17	111
Germany	1,870	161	456	1,870	161	456
Greece	375	95	639	375	95	639
Japan	1,210	14	406	1,210	14	406
Korea, Republic of	428	6	226	428	6	226
Mexico	41,300	4,210	37,300	41,300	4,210	37,300
Netherlands	6,900	141	1,980	6,900	141	1,980
Peru	5,850	534	4,470	5,850	534	4,470
Other	494	57	497	494	57	497
Total	104,000	8,070	73,600	104,000	8,070	73,600

-- Zero.

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

<sup>2</sup>May include revisions to previously published data.

<sup>3</sup>Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 6  
U.S. EXPORTS OF ZINC<sup>1</sup>

(Gross weight, unless otherwise specified)

Material	2022		2023			
	Quantity (metric tons)	Value (thousands)	September		January–September <sup>2</sup>	
			Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Ore and concentrate (zinc content)	644,000	\$1,530,000	129,000	\$199,000	546,000	\$821,000
Unwrought:						
Refined zinc	8,070	28,300	155	567	3,720	11,600
Zinc alloys	44,300	124,000	2,450	8,730	28,000	88,600
Wrought:						
Bars, rods, profiles, wire	3,220	21,200	264	1,030	1,640	7,950
Plates, sheets, strip, foil	5,830	24,800	489	1,960	3,900	15,800
Ash and residues: <sup>3</sup>						
Hard zinc spelter	12,300	29,300	1,420	2,580	9,700	18,700
Other (zinc content)	26,900	52,900	1,790	2,650	17,600	28,500
Other:						
Powders, flakes, dust	10,600	51,700	731	3,140	5,650	27,600
Waste and scrap	190,000	183,000	3,010	3,870	35,800	42,600
Chemicals:						
Lithopone	510	1,900	4	15	277	972
Zinc chloride	1,250	1,550	58	83	884	1,480
Zinc oxide	71,300 <sup>†</sup>	137,000	6,440	10,000	54,500	83,200
Zinc sulfate	808	769	15	11	441	369
Zinc sulfide	2,400	14,500	95	702	1,610	10,000

<sup>†</sup>Revised.

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

<sup>2</sup>May include revisions to previously published data.

<sup>3</sup>Other than from the manufacture of iron and steel; containing mainly zinc.

Source: U.S. Census Bureau.



TABLE 7  
U.S. EXPORTS OF ZINC, BY TYPE OF MATERIAL AND COUNTRY OR LOCALITY<sup>1</sup>

(Metric tons, gross weight, unless otherwise specified)

Material and country or locality	2022	2023	
		September	January–September <sup>2</sup>
Ore and concentrate (zinc content):			
Australia	19,300	--	63,500
Belgium	45,200	2,730	48,700
Canada	241,000	46,600	167,000
China	49,400	5,170	26,400
Finland	23,300	--	23,900
Japan	63,400	11,800	37,400
Korea, Republic of	120,000	33,300	116,000
Netherlands	3,080	--	--
Spain	79,500	29,200	61,100
Other	43	4	2,830
Total	644,000	129,000	546,000
Refined zinc:			
Belgium	758	--	--
Brazil	--	--	1,880
Canada	1,460	66	687
Italy	2,470	--	1
Mexico	2,840	89	1,120
Other	543	--	27
Total	8,070	155	3,720
Oxide:			
Belgium	387	1	239
Brazil	285	3	131
Canada	3,710	518	1,580
Colombia	275	67	197
Finland	797	100	715
India	828	102	1,080
Italy	108	--	174
Japan	38	4	353
Mexico	63,500	5,570	48,700
United Kingdom	145	--	225
Other	1,260	77	1,120
Total	71,300	6,440	54,500

-- Zero.

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

<sup>2</sup>May include revisions to previously published data.

Source: U.S. Census Bureau.

TABLE 8  
AVERAGE PRICES FOR SPECIAL HIGH GRADE ZINC

Period	North American		London Metal Exchange	
	Premium	Price <sup>1</sup>	cash <sup>2</sup>	
	¢/lb.	¢/lb.	¢/lb.	\$/t
2022:				
September	39.0	181.18	142.23	3,135.72
October	38.2	172.40	134.22	2,959.05
November	38.4	170.98	132.58	2,922.97
December	36.9	178.75	141.86	3,127.50
January–December	32.1	190.19	158.05	3,484.42
2023:				
January	37.0	186.20	149.17	3,288.55
February	37.0	179.60	142.57	3,143.04
March	36.1	170.16	134.06	2,955.59
April	34.4	160.11	125.74	2,772.06
May	33.1	145.49	112.36	2,477.10
June	31.9	139.33	107.39	2,367.64
July	30.7	139.33	108.68	2,395.99
August	29.4	138.23	108.88	2,400.48
September	29.0	141.86	112.84	2,487.75
January–September	33.2	155.59	122.41	2,698.69

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

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

Source: S&P Global Platts Metals Week.

TABLE 9  
LONDON METAL EXCHANGE (LME) STOCKS OF SPECIAL HIGH GRADE ZINC, END OF PERIOD

(Metric tons)

Period	United States			Asia	Europe	Middle East	Total LME
	Baltimore, MD	New Orleans, LA	Total				
2022:							
September	975	750	1,725	49,925	25	1,950	53,625
October	650	--	650	42,450	25	1,700	44,825
November	350	--	350	39,550	25	1,300	41,225
December	25	--	25	29,425	25	1,000	30,475
2023:							
January	--	--	--	15,475	--	1,000	16,475
February	--	--	--	32,225	--	1,000	33,225
March	--	--	--	44,300	--	750	45,050
April	--	--	--	52,525	--	400	52,925
May	--	--	--	87,400	--	50	87,450
June	--	--	--	80,225	--	50	80,275
July	--	--	--	99,300	--	50	99,350
August	--	--	--	153,525	--	50	153,575
September	--	--	--	102,725	--	50	102,775

-- Zero.

Source: London Metal Exchange, Ltd.