

Mineral Industry Surveys

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MANUFACTURED ABRASIVES IN THE FOURTH QUARTER 2023

The U.S. Geological Survey (USGS) collects quarterly data on manufactured abrasives through its survey of producers. Manufactured abrasives included in this report are metallic abrasives, fused aluminum oxide, and silicon carbide. Where indicated, data from the United States and Canada are combined to avoid disclosing proprietary information. Except where noted, the quantities cited in this report are in metric units. All unit value calculations in this report are based on unrounded data.

Metallic Abrasives

During the fourth quarter of 2023, an estimated 59,900 metric tons (t) of steel shot and grit valued at an estimated \$34.8 million was produced, and an estimated 68,400 t valued at an estimated \$68.4 million was shipped in the United States. This was compared with an estimated 44,100 t valued at \$32.8 million produced and an estimated 50,000 t valued at \$42.0 million shipped during the fourth quarter of 2022 and an estimated 45,400 t valued at \$33.1 million produced and an estimated 51,800 t valued at \$31.6 million shipped during the third quarter of 2023. At least one company produced shot and grit from reclaimed material. Production of other types of metallic shot and grit (primarily cut wire shot) were estimated to be 754 t valued at \$2.76 million, compared with production of 1,000 t valued at \$3 million during the fourth quarter of 2022 and 571 t valued at \$2.63 million during the third quarter of 2023. Shipments were estimated to be 783 t valued at \$2.89 million, compared with 1,000 t valued at \$3 million during the fourth quarter of 2022 and 593 t valued at \$2.76 million during the third quarter of 2023. Total fourth quarter 2023 production of metallic abrasives was 60,700 t valued at \$37.5 million, for an average unit value of \$619 per metric ton. Total fourth quarter 2023 shipments of metallic abrasives were 69,200 t valued at \$71.3 million, for an average unit value of \$1,030 per metric ton. Total production in 2023 for all types of metallic shot and grit was estimated to be 198,000 t valued at

\$140 million compared with an estimated 180,000 t valued at \$160 million during 2022 (table 1).

Imports of all types of metallic abrasives during the fourth quarter of 2023 were 4,350 t valued at \$7.87 million, for an average unit value of \$1,810 per metric ton (table 2).

Exports of all types of metallic abrasives during the fourth quarter of 2023 were 6,030 t valued at \$8.53 million, for an average unit value of \$1,420 per metric ton (table 2).

Fused Aluminum Oxide

Combined production of regular-grade crude fused aluminum oxide in the United States and Canada during the fourth quarter of 2023 was estimated to be 5,000 t with an estimated value of \$882,000, which has been unchanged in quantity for several years owing to production figures being rounded to the nearest 5,000 t to avoid disclosing proprietary data. However, this value was a 10% increase from that of the fourth quarter of 2022 and a 5% increase from that of the third quarter of 2023. Total production in 2023 for regular-grade crude fused aluminum oxide was 25,000 t valued at \$3.40 million, compared with 20,000 t valued at \$3.20 million in 2022 (table 1).

Imports of crude fused aluminum oxide during the fourth quarter of 2023 were 23,200 t valued at \$14.6 million, for an average unit value of \$630 per metric ton. Imports of ground and refined fused aluminum oxide for the same period were 9,530 t valued at \$13.6 million, for an average unit value of \$1,430 per metric ton (table 2).

Exports of crude fused aluminum oxide for the fourth quarter of 2023 were 2,270 t valued at \$6.79 million, for an average unit value of \$2,990 per metric ton (table 2).

Silicon Carbide

Production quantities are rounded to the nearest 5,000 t to avoid disclosing proprietary data. Total production of abrasive-grade silicon carbide in the United States during the fourth quarter of 2023 was estimated to be 15,000 t with an

estimated value of \$7.64 million, compared with 10,000 t valued at \$6.70 million in the fourth quarter of 2022 and 10,000 t valued at \$7.28 million in the third quarter of 2023. Total production in 2023 of abrasive-grade silicon carbide was 45,000 t valued at \$28.8 million, compared with 40,000 t valued at \$28.2 million in 2022 (table 1).

Imports of crude silicon carbide during the fourth quarter of 2023 were 24,700 t valued at \$20.9 million, for an average unit value of \$847 per metric ton. Imports of ground and refined silicon carbide for the same period were 7,650 t valued at \$31.2 million, for an average unit value of \$4,070 per metric ton (table 2).

Exports of crude silicon carbide during the fourth quarter of 2023 were 828 t with a value of \$1.03 million, for an

average unit value of \$1,250 per metric ton. Exports of ground and refined silicon carbide for the same period were 1,420 t valued at \$4.39 million, for an average unit value of \$3,080 per metric ton (table 2).

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TABLE 1
PRODUCTION AND SHIPMENTS OF ALUMINUM OXIDE, SILICON CARBIDE, AND METALLIC ABRASIVES¹

Source and product	2022									
	4th quarter		1st quarter–4th quarter							
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)						
United States, production:										
Steel shot and grit ^e	44,100	\$32,800	176,000	148,000						
Other shot and grit ^{e, 2}	1,000	3,000	4,000	12,000						
Total ^e	45,100	35,800	180,000	160,000						
United States, shipments:										
Steel shot and grit ^e	50,000	42,000	195,000	174,000						
Other shot and grit ^{e, 2}	1,000	3,000	4,000	12,000						
Total ^e	51,000	45,000	199,000	186,000						
United States and Canada, production: ^{e, 3}										
Crude aluminum oxide, regular-grade	5,000	800	20,000	3,200						
United States, production: ^{e, 3}										
Silicon carbide ⁴	10,000	6,700	40,000	28,200						

Source and product	2023									
	1st quarter		2nd quarter		3rd quarter		4th quarter		1st quarter–4th quarter	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
United States, production:										
Steel shot and grit ^e	42,700	\$29,800	47,100	\$32,700	45,400	\$33,100	59,900	\$34,800	195,000	\$130,000
Other shot and grit ^{e, 2}	544	2,000	600	\$2,200	571	\$2,630	754	\$2,760	2,470	\$9,600
Total ^e	43,300	31,800	47,700	\$34,900	46,000	\$35,800	60,700	\$37,500	198,000	\$140,000
United States, shipments:										
Steel shot and grit ^e	49,400	30,100	54,400	\$33,100	51,800	\$31,600	68,400	\$68,400	224,000	\$163,000
Other shot and grit ^{e, 2}	565	2,510	623	\$2,760	593	\$2,760	783	\$2,890	2,560	\$10,900
Total ^e	49,900	32,600	55,000	\$35,900	52,400	\$34,400	69,200	\$71,300	227,000	\$174,000
United States and Canada, production: ^{e, 3}										
Crude aluminum oxide, regular-grade	5,000	800	5,000	\$880	5,000	\$840	5,000	\$882	25,000	\$3,400
United States, production: ^{e, 3}										
Silicon carbide ⁴	10,000	6,620	10,000	\$7,280	10,000	\$7,280	15,000	7,640	45,000	28,800

^eEstimated.

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

²Includes cut wire shot and reclaimed shot and grit from primary producers.

³Quantities are rounded to the nearest 5,000 tons to avoid disclosing proprietary data. Values are rounded to avoid disclosing proprietary data.

⁴Includes materials for metallurgical uses and other applications.

TABLE 2
U.S. EXPORTS AND IMPORTS FOR CONSUMPTION OF ALUMINUM OXIDE, SILICON CARBIDE, AND METALLIC ABRASIVES¹

Source and product	2022			
	4th quarter		1st quarter–4th quarter	
	Quantity (metric tons)	Value ² (thousands)	Quantity (metric tons)	Value ² (thousands)
Exports:				
Metallic abrasives	6,870	\$9,680	23,900	\$39,000
Aluminum oxide, crude	2,630	10,900	14,400	52,000
Silicon carbide:				
Crude	899	2,910	3,950	8,100
Ground and refined	1,910	5,260	8,100	22,000
Imports for consumption:				
Metallic abrasives	4,740	9,280	20,100	42,800
Aluminum oxide:				
Crude	39,500	30,600	163,000	130,000
Ground and refined	14,800	25,100	62,000	96,700
Silicon carbide:				
Crude	29,700	34,800	128,000	137,000
Ground and refined	7,290	35,400	37,300	136,000

Source and product	2023									
	1st quarter		2nd quarter		3rd quarter		4th Quarter		1st quarter–4th quarter	
	Quantity (metric tons)	Value ² (thousands)	Quantity (metric tons)	Value ² (thousands)	Quantity (metric tons)	Value ² (thousands)	Quantity (metric tons)	Value ² (thousands)	Quantity (metric tons)	Value ² (thousands)
Exports:										
Metallic abrasives	5,650	\$8,780	5,830	\$9,380	6,590	\$9,780	6,030	8,530	24,100	\$36,500
Aluminum oxide, crude	2,220	8,280	2,890	11,200	2,170	6,540	2,270	6,790	9,540	\$32,800
Silicon carbide:										
Crude	882	1,930	888	1,440	865	1,840	828	1,030	3,460	\$6,250
Ground and refined	1,630	6,000	2,010	6,100	1,600	4,550	1,420	4,390	6,660	\$21,000
Imports for consumption:										
Metallic abrasives	4,570	9,370	4,760	8,280	4,120	7,380	4,350	7,870	17,800	\$32,900
Aluminum oxide:										
Crude	16,800	11,400	17,000	11,100	12,000	8,020	23,200	14,600	68,900	\$45,200
Ground and refined	14,700	21,600	16,000	20,800	10,700	14,300	9,530	13,600	51,000	\$70,300
Silicon carbide:										
Crude	21,100	17,800	20,800	21,100	18,100	16,900	24,700	20,900	84,800	\$76,700
Ground and refined	6,650	28,700	8,540	32,800	5,950	32,400	7,650	31,200	28,800	\$125,000

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

²Export values are free alongside ship values; import values are customs values.

Source: U.S. Census Bureau.