

# Mineral Industry Surveys

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## MANUFACTURED ABRASIVES IN THE FOURTH QUARTER 2018

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 2018, an estimated 44,000 metric tons (t) of steel shot and grit valued at \$26 million was produced in the United States, essentially unchanged from 43,700 t valued at \$26 million during the same period in 2017. At least one company produced shot and grit from reclaimed material. Production of other types of metallic shot and grit (primarily cut wire shot) was an estimated 1,000 t valued at \$2 million during the fourth quarter of 2018 compared with an estimated 1,000 t valued at \$3 million during the fourth quarter of 2017. Total fourth quarter 2018 production of metallic abrasives was estimated to be 45,000 t valued at \$28 million, for an average unit value of \$640 per ton. Total production in 2018 was an estimated 180,000 t valued at \$113 million. Total production in 2017 was 179,000 t with an estimated value of \$120 million.

Shipments of steel shot and grit in the fourth quarter of 2018 were 48,000 t valued at \$33 million, or an average of \$688 per ton, compared with shipments of 47,900 t valued at \$33 million, or an average of \$688 per ton, during the fourth quarter of 2017. Shipments of steel shot and grit for all of 2018 were 192,000 t valued at \$132 million, compared with shipments during 2017, which were 194,000 t valued at \$140 million. Shipments of other types of metallic shot in the fourth quarter of 2018 were an estimated 1,000 t valued at \$3 million, compared with shipments during the fourth quarter of 2017, which were an estimated 740 t valued at \$3 million. Total fourth quarter 2018 shipments of metallic abrasives were

49,000 t valued at \$36 million, for an average unit value of \$735 per ton.

Imports of all types of metallic shot and grit during the fourth quarter of 2018 were 7,320 t valued at \$9.25 million for an average of \$1,260 per ton. Canada and China (24% each), Turkey (13%), and South Africa and Thailand (11% each) were the leading import sources.

Exports of all types of metallic abrasives during the fourth quarter of 2018 were 8,070 t valued at \$9.51 million, for an average unit value of \$1,180 per ton. Shipments to Mexico accounted for 72% of the exports, 19% was shipped to Canada, and 9% to other countries.

### Fused Aluminum Oxide

Combined production of regular-grade crude fused aluminum oxide in the United States and Canada during the fourth quarter of 2018 was estimated to be 5,000 t with an estimated value of \$800,000, which was unchanged in quantity and value from that of the fourth quarter of 2017 and the third quarter of 2018. Total production in 2018 was 10,000 t valued at \$1.70 million, which was unchanged in quantity and value from that of 2017. Production figures were rounded to the nearest 5,000 t to avoid disclosing proprietary data.

According to the U.S. Census Bureau, United States imports of crude fused aluminum oxide during the fourth quarter of 2018 were 43,400 t valued at \$30.8 million; imports from China were 35,400 t valued at \$25.0 million. The average unit value of imported crude fused aluminum oxide, excluding crude fused aluminum oxide from China, was \$727 per ton; the average unit value of crude fused aluminum oxide from China was \$707 per ton. About 81% of the imports came from China, 18% from Hong Kong, and 1% from several other countries.

United States imports of ground and refined fused aluminum oxide for the fourth quarter of 2018 were 18,100 t valued at \$23.5 million. The average unit value of imported ground and refined fused aluminum oxide was \$1,300 per ton. About 23% of the imports came from Canada, 16% each from Austria and Brazil, 13% from China, 11% from Germany, 6%

from France, 5% each from Bahrain and Hungary, and the remainder from several other countries combined.

United States exports of crude fused aluminum oxide for the fourth quarter of 2018 were 5,500 t valued at \$13.9 million, or \$2,520 per ton. Canada received 65% of the exports, followed by Mexico, 18%; Germany, 5%; the Republic of Korea, 3%; and other countries, 9%.

### **Silicon Carbide**

Total production of abrasive-grade silicon carbide in the United States and Canada during the fourth quarter of 2018 was estimated to be 10,000 t with an estimated value of \$7.40 million, which was unchanged in quantity and value from that of both the fourth quarter of 2017 and the third quarter of 2018. Total production in 2018 was 35,000 t valued at \$26.0 million, which is unchanged in quantity and value from that of 2017. These production figures were rounded to the nearest 5,000 t to avoid disclosing proprietary data.

Total United States imports of crude silicon carbide during the fourth quarter of 2018 were 25,400 t valued at \$16.0 million; imports from China were 19,200 t valued at \$12.0 million. The average unit value of imported crude silicon carbide was \$629 per ton. The primary import source was China at 75%.

United States imports of ground and refined silicon carbide for the same period were 8,940 t valued at \$19.2 million; imports from China were 3,100 t valued at \$4.3 million. The average unit value of imported ground and refined silicon carbide, excluding ground and refined silicon carbide from China, was \$2,540 per ton; the average unit value of ground and refined silicon carbide from China was \$1,380 per ton. During the fourth quarter of 2018, China accounted for 35% of the ground and refined material imported, followed by Brazil, 28%; Canada, 13%; South Africa, 7%; Norway, 6%; Russia, 5%; and other countries, 6%.

U.S. exports of crude silicon carbide during the fourth quarter of 2018 were 975 t with a value of \$1.59 million, or \$1,630 per ton. Fourth quarter exports of ground and refined silicon carbide were 2,150 t valued at \$5.96 million, or \$2,770 per ton. About 37% of crude material was shipped to Norway, 30% was shipped to the United Kingdom, and 26% went to Germany. Refined material was primarily shipped to Canada (36%), and Japan and the Netherlands (18% each).

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TABLE 1  
PRODUCTION AND SHIPMENTS OF ALUMINUM OXIDE, SILICON CARBIDE, AND METALLIC ABRASIVES<sup>1</sup>

Source and product	2017				2018									
	4th quarter		1st quarter–4th quarter		1st quarter		2d quarter		3d quarter		4th quarter		1st quarter–4th quarter	
	Quantity (metric tons)	Value <sup>e</sup> (thousands)	Quantity (metric tons)	Value <sup>e</sup> (thousands)	Quantity (metric tons)	Value <sup>e</sup> (thousands)	Quantity (metric tons)	Value <sup>e</sup> (thousands)	Quantity (metric tons)	Value <sup>e</sup> (thousands)	Quantity (metric tons)	Value <sup>e</sup> (thousands)	Quantity (metric tons)	Value <sup>e</sup> (thousands)
United States, production:														
Steel shot and grit	43,700	\$26,000	177,000	\$113,000	44,000	\$26,000	44,000	\$26,000	44,000	\$26,000	44,000	\$26,000	176,000	\$104,000
Other shot and grit <sup>e,2</sup>	1,000	3,000	2,000	7,000	1,000	2,000	1,000	2,000	1,000	2,000	1,000	2,000	4,000	\$8,600
Total <sup>e</sup>	45,000	29,000	179,000	120,000	45,000	28,000	45,000	28,000	45,000	28,000	45,000	28,000	180,000	113,000
United States, shipments:														
Steel shot and grit	47,900	33,000	194,000	140,000	47,900	33,000	47,900	33,000	48,000	33,000	48,000	33,000	192,000	132,000
Other shot and grit <sup>e,2</sup>	740	3,000	2,140	9,000	1,000	3,000	1,000	3,000	1,000	3,000	1,000	3,000	4,000	12,000
Total	48,600	36,000	197,000	149,000	48,900	36,000	48,900	36,000	49,000	36,000	49,000	36,000	196,000	144,000
United States and Canada, production: <sup>e,3</sup>														
Crude aluminum oxide, regular-grade	5,000	800	10,000	1,700	5,000	800	5,000	800	5,000	800	5,000	800	10,000	1,700
Silicon carbide <sup>4</sup>	10,000	7,400	35,000	26,000	10,000	7,400	10,000	7,400	10,000	7,400	10,000	7,400	35,000	26,000

<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 cut wire shot and reclaimed shot and grit from primary producers.

<sup>3</sup>Quantities are rounded to the nearest 5,000 tons to avoid disclosing company proprietary data. Values are rounded to avoid disclosing company proprietary data.

<sup>4</sup>Includes materials for metallurgical uses and other applications.

TABLE 2  
U.S. EXPORTS AND IMPORTS FOR CONSUMPTION OF ALUMINUM OXIDE, SILICON CARBIDE, AND METALLIC ABRASIVES<sup>1</sup>

Source and product	2017									
	4th quarter		1st quarter–4th quarter							
	Quantity (metric tons)	Value <sup>2</sup> (thousands)	Quantity (metric tons)	Value <sup>2</sup> (thousands)						
<b>Exports:</b>										
Metallic abrasives	7,930	\$11,300	3,890	\$15,300						
Aluminum oxide, crude	3,840	13,500	15,500	54,800						
<b>Silicon carbide:</b>										
Crude	614	739	2,210	4,130						
Ground and refined	992	3,900	3,890	15,300						
<b>Imports for consumption:</b>										
Metallic abrasives	7,230	7,590	29,700	30,200						
<b>Aluminum oxide:</b>										
Crude	40,700	22,100	147,000	72,000						
Ground and refined	13,400	17,400	57,900	70,500						
<b>Silicon carbide:</b>										
Crude	27,300	12,600	103,000	49,400						
Ground and refined	9,180	15,900	33,500	58,200						
Source and product	2018									
	1st quarter		2d quarter		3d quarter		4th quarter		1st quarter–4th quarter	
	Quantity (metric tons)	Value <sup>2</sup> (thousands)	Quantity (metric tons)	Value <sup>2</sup> (thousands)	Quantity (metric tons)	Value <sup>2</sup> (thousands)	Quantity (metric tons)	Value <sup>2</sup> (thousands)	Quantity (metric tons)	Value <sup>2</sup> (thousands)
<b>Exports:</b>										
Metallic abrasives	8,620	\$11,000	8,290	\$10,700	8,620	\$10,800	8,070	\$9,510	33,600	\$42,000
Aluminum oxide, crude	4,670	14,800	4,350	16,400	4,800	14,600	5,500	13,900	19,300	59,700
<b>Silicon carbide:</b>										
Crude	830	980	814	1,090	880	1,350	975	1,590	3,500	5,010
Ground and refined	1,290	4,450	1,620	4,700	1,570	4,140	2,150	5,960	6,630	19,300
<b>Imports for consumption:</b>										
Metallic abrasives	7,430	7,790	8,880	9,520	6,210	8,710	7,320	9,250	29,800	35,300
<b>Aluminum oxide:</b>										
Crude	35,400	22,400	12,900	9,790	30,200	21,300	43,400	30,800	122,000	84,300
Ground and refined	14,600	18,700	18,400	24,100	19,200	24,100	18,100	23,500	70,300	90,300
<b>Silicon carbide:</b>										
Crude	26,700	14,200	22,700	17,500	32,100	23,900	25,400	16,000	107,000	71,600
Ground and refined	7,390	16,900	10,800	20,300	12,400	20,500	8,940	19,200	39,500	76,800

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

<sup>2</sup>Export values are free alongside ship values; import values are customs values.

Source: U.S. Census Bureau.