

# Mineral Industry Surveys

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## MANUFACTURED ABRASIVES IN THE FIRST QUARTER 2014

The U.S. Geological Survey (USGS) collects quarterly data on manufactured abrasives through its survey of producers. Manufactured abrasives included in this report are fused aluminum oxide, silicon carbide, and metallic abrasives. Where indicated, data for Canada and the United States are combined to protect 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.

### Fused Aluminum Oxide

Combined production from Canada and the United States during the first quarter of 2014 was estimated to be 5,000 metric tons (t) of regular-grade crude fused aluminum oxide with an estimated value of \$800,000, which was essentially unchanged in quantity and value from that of both the first and fourth quarters of 2013. One company, operating one plant in Canada and one in the United States, produced fused aluminum oxide. These production figures have been rounded to the nearest 5,000 t to avoid disclosing proprietary data.

According to the U.S. Census Bureau, U.S. imports of crude fused aluminum oxide during the first quarter of 2014 were 18,600 t valued at \$12.8 million; imports from China were 17,300 t valued at \$11.7 million. The average price of imported crude fused aluminum oxide, excluding Chinese crude fused aluminum oxide, was \$812 per ton; the average price of crude from China was \$677 per ton. About 93% of the imports came from China, 7% from Canada, and less than 1% from Germany, Ukraine, and India, combined. Imports of crude fused aluminum oxide from China may not all be abrasive-quality material.

U.S. imports of ground and refined fused aluminum oxide for the first quarter of 2014 were 11,000 t valued at \$16.8 million; imports from China were 1,100 t valued at \$3.32 million. The average price of imported ground and refined fused aluminum oxide, excluding ground and refined fused aluminum oxide from China, was \$1,360 per ton; the average price of ground and refined fused aluminum oxide from China was \$3,030 per ton. About 27% of the imports came from Brazil, 22% from Austria, 15% from Germany, 10% from China, 10% from Canada, and 16% from other countries.

U.S. exports of crude fused aluminum oxide for the first quarter of 2014 were 4,750 t. These exports were valued at \$16.6 million, or \$3,490 per ton. Canada received 40% of the exports that were shipped; Mexico, 22%; Germany, 14%; and other countries, 24%. U.S. exports of ground and refined fused aluminum oxide for the first quarter of 2014 were 597,000 t valued at \$249 million, or \$417 per ton. Canada received 22% of the exports that were shipped; Egypt, 21%; Iceland, 20%; Norway, 16%; and other countries, 21%.

### Silicon Carbide

Abrasive-grade silicon carbide is produced by one company in the United States. The total production of abrasive-grade silicon carbide during the first quarter of 2014 was estimated to be 10,000 t, with an estimated value of \$7.4 million, which was essentially unchanged in quantity and value from that of both the first and fourth quarters of 2013. These production figures have been rounded to the nearest 5,000 t to avoid disclosing proprietary data.

Total U.S. imports of crude silicon carbide during the first quarter of 2014 were 27,800 t valued at \$16.4 million; imports from China were 10,700 t valued at \$7.19 million. The average price of imported crude silicon carbide, excluding crude from China, was \$537 per ton; the average price of crude from China was \$673 per ton. U.S. imports of ground and refined silicon carbide for the same period were 7,810 t valued at \$13.3 million; imports from China were 3,400 t valued at \$4.59 million. The average price of imported ground and refined silicon carbide, excluding ground and refined silicon carbide from China, was \$1,970 per ton; the average price of ground and refined silicon carbide from China was \$1,350 per ton. During the first quarter of 2014, China accounted for 38% of the crude material and 44% of the ground and refined material imported.

U.S. exports of crude silicon carbide during the first quarter of 2014 were reported to be 4,930 t with a value of \$5.65 million. First quarter exports of ground and refined silicon carbide were 1,480 t valued at \$4.66 million. About 99% of the crude material was shipped to, in decreasing order of quantity,

Norway, Mexico, and Japan. About 90% of the refined material was shipped to, in decreasing order of quantity, Canada, Mexico, Germany, China, and Japan.

#### **Metallic Abrasives**

Metallic abrasives information was collected from 10 companies operating 11 U.S. plants. During the first quarter of 2014, five companies produced 47,000 t of steel shot and grit, a slight decrease compared with that of the same period in 2013. At least one of the companies produced shot and grit from reclaimed material. Total first quarter 2014 production was valued at \$20.2 million, or an average of \$429 per ton. Total production in 2013 was 189,000 t valued at \$81.2 million.

Shipments of steel shot and grit in the first quarter of 2014 were 43,500 t valued at \$21.7 million, or an average of \$499 per ton, compared with shipments during the first quarter of 2013, which were 43,700 t valued at \$21.8 million for an average of \$500 per ton.

During the first quarter of 2014, five companies produced 483 t of other types of metallic shot and grit (primarily cut wire shot) valued at \$1.63 million.

Imports of all types of metallic shot and grit during the first quarter of 2014 were 6,100 t valued at \$6.13 million for an average of \$1,010 per ton, compared with imports during the first quarter of 2013, which were 5,510 t valued at \$5.64 million for an average of \$1,020 per ton. Canada, the Republic of Korea, Japan, Germany, China, Mexico, and Thailand were the leading suppliers, accounting for 47%, 13%, 10%, 9%, 8%, 4%, and 4% of the tonnage imported, respectively.

Exports of all types of metallic abrasives during the first quarter of 2014 were 8,440 t valued at \$11.8 million, or an average of \$1,400 per ton, compared with exports during the first quarter of 2013, which were 9,270 t valued at \$13.0 million, or an average of \$1,400 per ton. Shipments to Mexico accounted for 46% of the exports; an additional 22% was shipped to Canada and 12% was shipped to China.

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

Source and product	2013										2014	
	1st quarter		2d quarter		3d quarter		4th quarter		1st quarter– 4th quarter		1st quarter	
	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)						
United States and Canada, production: <sup>e,2</sup>												
Crude aluminum oxide, regular-grade	5,000	\$800	5,000	\$800	5,000	\$800	5,000	\$800	10,000	\$1,700	5,000	\$800
Silicon carbide <sup>3</sup>	10,000	7,400	10,000 <sup>r</sup>	7,400 <sup>r</sup>	10,000	7,400	10,000	7,400	35,000 <sup>r</sup>	25,900	10,000	7,400
United States, production:												
Steel shot and grit	47,200	20,300 <sup>r</sup>	47,200 <sup>r</sup>	20,300 <sup>r</sup>	47,200	20,300	47,200	20,300	189,000 <sup>r</sup>	81,200 <sup>r</sup>	47,000	20,200
Other shot and grit <sup>e,4</sup>	534	1,890 <sup>r</sup>	591	1,960 <sup>r</sup>	545	1,840	549	1,880	2,220	7,570 <sup>r</sup>	483	1,630
Total	47,700	22,200 <sup>r</sup>	47,700 <sup>r</sup>	22,200 <sup>r</sup>	47,700	22,100	47,700	22,200	191,000 <sup>r</sup>	88,700 <sup>r</sup>	47,500	21,800
United States, shipments:												
Steel shot and grit	43,700 <sup>r</sup>	21,800 <sup>r</sup>	43,700 <sup>r</sup>	21,800 <sup>r</sup>	43,700	21,900	43,700	21,800	175,000 <sup>r</sup>	87,400 <sup>r</sup>	43,500	21,700
Other shot and grit <sup>e,4</sup>	514 <sup>r</sup>	2,100 <sup>r</sup>	584 <sup>r</sup>	2,260 <sup>r</sup>	498	1,910	530	2,000	2,130	8,260 <sup>r</sup>	526	2,090
Total	44,200 <sup>r</sup>	23,900 <sup>r</sup>	44,300 <sup>r</sup>	24,100 <sup>r</sup>	44,200	23,800	50,100	23,800	177,000 <sup>r</sup>	95,600 <sup>r</sup>	44,100	23,800

<sup>e</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>Quantities are rounded to the nearest 5,000 tons to avoid disclosing proprietary data; values are estimated.

<sup>3</sup>Includes materials for metallurgical uses and other applications.

<sup>4</sup>Includes cut wire shot and reclaimed shot and grit from primary producers.

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

Source and product	2013										2014	
	1st quarter		2d quarter		3d quarter		4th quarter		1st quarter– 4th quarter		1st 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)						
<b>Exports:</b>												
<b>Aluminum oxide:</b>												
Crude	4,850	\$17,400	6,890	\$16,800	6,070	\$16,300	4,160	\$15,400	22,000	\$65,900	4,750	\$16,600
Ground and refined	460,000	198,000	527,000	207,000	622,000	235,000	565,000	230,000	2,170,000	871,000	597,000	249,000
<b>Silicon carbide:</b>												
Crude	3,480	4,140	2,640	3,200	3,350	4,800	4,200	5,220	13,700	17,400	4,940	5,650
Ground and refined	1,350	4,640	1,410	4,350	968	4,290	991	4,280	4,720	17,600	1,480	4,660
Metallic abrasives	9,270	13,000	8,730	12,400	8,160	11,700	9,760	13,900	35,900	51,100	8,440	11,800
<b>Imports for consumption:</b>												
<b>Aluminum oxide:</b>												
Crude	47,800	30,300	22,900	15,200	31,300	20,900	33,700	23,300	136,000	89,600	18,600	12,800
Ground and refined	5,510 <sup>r</sup>	5,640 <sup>r</sup>	5,880	5,950	6,750	7,150	5,930	6,100	24,100	24,800	11,000	16,800
<b>Silicon carbide:</b>												
Crude	17,800	11,900	22,400	17,300	30,400	16,200	19,600	12,100	90,200	57,500	27,800	16,400
Ground and refined	5,490	12,100	8,430	16,900	7,950	15,500	6,880	12,800	28,700	57,400	7,810	13,300
Metallic abrasives	5,510	5,640	5,880	5,950	6,750	7,150	5,930	6,100	24,100	24,800	6,100	6,130

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

Source: U.S. Census Bureau.