

# Mineral Industry Surveys

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## MANUFACTURED ABRASIVES IN THE FOURTH QUARTER 2012

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, Canadian and United States data 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

The United States and Canadian combined production during the fourth quarter of 2012 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 fourth quarter of 2011 and third quarter of 2012. 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 fourth quarter of 2012 were 44,600 t valued at \$24.3 million, or an average of \$545 per ton. About 66% of the imports came from China, 14% from Venezuela, 11% from Guyana, 9% from Canada, and less than 1% from other countries.

U.S. imports of ground and refined fused aluminum oxide for the fourth quarter of 2012 were 24,100 t valued at \$18.8 million, or an average of \$779 per ton.

U.S. exports of crude fused aluminum oxide for the fourth quarter of 2012 were 4,720 t. These exports were valued at \$15.7 million, or \$3,330 per ton. Canada received 54% of the exports that were shipped; Mexico, 18%; Germany, 7%; Japan and the United Kingdom, 5% each; Austria and the Republic of Korea, 2% each; and others, 7%. U.S. exports of ground fused aluminum oxide for the fourth quarter of 2012 were 473,000 t valued at \$210 million, or \$443 per ton. Canada received 46% of the exports that were shipped; Russia, 19%; Iceland, 13%; Egypt, 11%; Latvia, 6%; Mexico, 2%; and others, 3%.

### 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 fourth quarter of 2012 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 fourth quarter of 2011 and third quarter of 2012. 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 fourth quarter of 2012 were 3,180 t valued at \$2.90 million. The average customs value of imported crude silicon carbide was \$912 per ton. U.S. imports of ground and refined silicon carbide for the same period were 4,120 t valued at \$11.4 million, or an average of \$2,760 per ton. During the fourth quarter of 2012, China accounted for only 2% of the crude material and 27% of the ground and refined material imported.

U.S. exports of crude silicon carbide during the fourth quarter of 2012 were reported to be 3,810 t with a value of \$5.37 million. Fourth quarter exports of ground and refined silicon carbide were 1,300 t valued at \$4.27 million. About 99% of the crude material was shipped to, in decreasing order of quantity, Norway, Netherlands, Germany, and Taiwan. About 92% of the refined material was shipped to, in decreasing order of quantity, Canada, Mexico, Germany, China, Japan, and the United Kingdom.

### Metallic Abrasives

Metallic abrasives information was collected from 10 companies operating 11 U.S. plants. During the fourth quarter of 2012, five companies produced 48,500 t of steel shot and grit, a slight decrease compared with that of the same period in 2011. At least one of the companies produced shot and grit from reclaimed material. Total fourth quarter 2012 production was valued at \$23.5 million, or an average of \$485 per ton. Total production in 2012 was 190,000 t valued at \$92.9 million, compared with total production in 2011 of 200,000 t valued at \$103 million.

Shipments of steel shot and grit in the fourth quarter of 2012 were 53,100 t valued at \$30.4 million, or an average of \$572 per ton, compared with shipments during the fourth quarter of 2011, which were 49,100 t valued at \$29.1 million for an average of \$593 per ton.

During the fourth quarter of 2012, five companies produced 498 t of other types of metallic shot and grit (primarily cut wire shot) valued at \$1.91 million.

Imports of all types of metallic shot and grit during the fourth quarter of 2012 were 5,300 t valued at \$5.45 million for an average of \$1,030 per ton, compared with imports during the fourth quarter of 2011, which were 5,190 t valued at \$5.20

million for an average of \$1,000 per ton. Canada, China, Japan, Germany, and the Republic of Korea were the leading suppliers, accounting for 46%, 14%, 13%, 11%, and 8% of the tonnage imported, respectively.

Exports of all types of metallic abrasives during the fourth quarter of 2012 were 9,550 t valued at \$14.8 million, or an average of \$1,540 per ton, compared with exports during the fourth quarter of 2011, which were 10,100 t valued at \$13.5 million, or an average of \$1,330 per ton. Shipments to Mexico accounted for 37% of the exports, an additional 29% was shipped to China, 19% was shipped to Canada, and 6% was shipped to Japan.

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

Source and product	2011				2012									
	4th quarter		Year		1st quarter		2nd quarter		3rd quarter		4th quarter		Year	
	Quantity (metric tons)	Value (thousands)												
United States and Canada, production: <sup>e, 2</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>3</sup>	10,000	7,400	35,000	25,900	10,000	7,400	10,000	7,400	10,000	7,400	10,000	7,400	35,000	25,900
United States, production:														
Steel shot and grit	49,200	27,700	200,000	103,000	44,700	21,900	48,700 <sup>r</sup>	23,700 <sup>r</sup>	48,700	23,700 <sup>r</sup>	48,500	23,500	190,000	92,900
Other shot and grit <sup>e, 4</sup>	437	1,610	1,950	7,100	752	1,820	481 <sup>r</sup>	1,780 <sup>r</sup>	446	1,590	498	1,920	2,180	7,110
Total	49,600	29,300	202,000	110,000	45,400	23,700	49,100 <sup>r</sup>	25,500 <sup>r</sup>	49,100	25,300 <sup>r</sup>	49,000	25,400	193,000	100,000
United States, shipments:														
Steel shot and grit	49,100	29,100	204,000	113,000	48,500	28,200	53,300 <sup>r</sup>	30,700 <sup>r</sup>	53,300	30,700	53,100	30,400	208,000	120,000
Other shot and grit <sup>e, 4</sup>	456	1,880	1,940	8,180	757	2,190	512 <sup>r</sup>	2,230 <sup>r</sup>	530	2,250	488	2,100	2,290	8,770
Total	49,600	31,000	206,000	122,000	49,200	30,400	53,800 <sup>r</sup>	32,900 <sup>r</sup>	53,900	32,900 <sup>r</sup>	53,600	32,500	211,000	129,000

<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	2011				2012									
	4th quarter		Year		1st quarter		2nd quarter		3rd quarter		4th quarter		Year	
	Quantity (metric tons)	Value <sup>2</sup> (thousands)												
<b>Exports:</b>														
<b>Aluminum oxide:</b>														
Crude	4,280	\$14,900	19,900	\$74,700	4,430	\$15,800	5,200	\$16,700	4,780	\$15,900	4,720	\$15,700	19,100	\$64,200
Ground and refined	367,000	174,000	1,660,000	824,000	435,000	186,000	325,000	171,000	450,000	190,000	473,000	210,000	1,680,000	756,000
<b>Silicon carbide:</b>														
Crude	3,380	6,010	20,800	30,400	3,550	4,750	2,690	4,320	4,750	6,140	3,810	5,370	14,800	20,600
Ground and refined	1,660	5,870	6,980	28,600	1,480	5,630	1,340	5,700	1,120	4,180	1,300	4,270	5,240	19,800
Metallic abrasives	10,100	13,500	39,500	55,000	10,700	13,300	8,960	12,200	9,840	13,200	9,550	14,800	39,000	53,400
<b>Imports for consumption:</b>														
<b>Aluminum oxide:</b>														
Crude	47,500	31,100	177,000	111,000	25,800	16,500	28,300	12,700	62,200	36,600	44,600	24,300	161,000	90,200
Ground and refined	12,200	16,900	46,400	62,900	11,200	17,600	11,600	21,000	23,100	18,500	24,100	18,800	70,000	75,900
<b>Silicon carbide:</b>														
Crude	18,600	24,800	76,800	97,100	27,900	25,000	9,230	17,600	21,900	16,500	3,180	2,900	62,200	62,000
Ground and refined	14,300	23,900	52,200	104,000	8,300	16,300	5,650	19,300	7,800	16,900	4,120	11,400	25,900	63,900
Metallic abrasives	5,190	5,200	49,600	34,700	5,700	5,470	17,700	5,740	5,360	5,070	5,300	5,450	34,000	21,700

<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, and import values are customs values.

Source: U.S. Census Bureau.