

# Mineral Industry Surveys

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## SILICON IN OCTOBER 2014

Domestic production of total silicon materials was 45,900 metric tons (t) for October 2014, a 12% increase from September 2014 production and a slight increase from October 2013 production. Net shipments were 28,100 t, slightly more than shipments in September 2014 and 9% less than October 2013. Total production and net shipments during the first 10 months of 2014 were both 8% greater than those during the same period in 2013 (table 1). Individual production-related statistics were concealed to avoid disclosing company proprietary data.

Ending stocks were 33,000 t in October 2014, slightly more than those in September 2014 and 5% less than those in October 2013 (table 1). Stocks included adjustments in inventory and in-plant consumption of ferrosilicon to produce magnesium ferrosilicon and other miscellaneous alloys.

Included in this Mineral Industry Surveys are U.S. spot market prices and U.S. foreign trade data for selected silicon-containing materials in October 2014. All comparative statistics were calculated based on gross-weight figures.

## Industry News

On October 3, Russia was removed from the United States' Generalized System of Preferences (GSP) program. The GSP program offers developing countries duty-free treatment for imported products, including ferroalloys. Russia's trade and economic development was determined to be sufficiently advanced, ending their inclusion in the GSP program (Fitzgerald, 2014).

JSC Chelyabinsk Electrometallurgical Integrated Plant (ChEMK), Russia's leading producer of ferroalloys, spent \$37.9 million to construct a new energy-efficient furnace. The new furnace is part of a multi-year project, which includes upgrading the company's eight ferrosilicon workshops (Dragomanovich, 2014).

Xinjiang Dianhe Silicon Industry Co., Ltd. began construction of new ferrosilicon furnaces in the Xinjiang Province of China. The project was expected to be completed in 2015. Once fully operational, Xinjiang Dianhe Silicon would be the leading

producer of ferrosilicon in the Province with an estimated capacity of 200,000 metric tons per year (Guo, 2014).

SunEdison LLC, a U.S.-based manufacturer of solar and semi-conductor products, started utilizing a new polysilicon process at their facility in Ulsan, Republic of Korea. The facility is a joint venture among SunEdison LLC, SunEdison Semiconductor Ltd., and Samsung Fine Chemicals Co., Ltd. The company claimed the technology, a high-pressure fluidized-bed reactor (HP-FBR), is capable of producing high-purity polysilicon using 90% less energy than non-FBR technologies (Barry, 2014).

Bluestar Silicones USA Corp. unveiled a new long-term silicone implant product line, Silbione® Biomedical Liquid Silicone Rubber (LSR). Available in a range of hardnesses, Silbione® Biomedical LSRs are designed for use in long-term implant applications of greater than 30 days (Bluestar Silicones USA Corp., 2014).

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## References Cited

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- Fitzgerald, Daniel, 2014, US removes Russia from GSP program: American Metal Market, October 7. (Accessed December 11, 2014, via <http://www.amm.com/>)

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TABLE 1  
 PRODUCTION, SHIPMENTS, AND STOCKS OF SILICON ALLOYS  
 AND METAL IN THE UNITED STATES<sup>1,2</sup>

(Metric tons, gross weight)

	Gross production <sup>3</sup>	Net shipments	Producers' stocks, end of period
<b>2013:<sup>p</sup></b>			
January–December	468,000	331,000	33,700
January–October <sup>r</sup>	384,000	273,000	34,800
October	45,200	30,800	34,800
November	44,300	27,800	37,100
December	40,000	29,700	33,700
<b>2014:</b>			
January	42,600	32,000	31,400
February	39,700	27,500	33,000
March	42,700	32,200	34,400
April	37,600	25,900	34,000
May	39,400	30,400	31,800
June	43,700	33,600	29,900
July	42,300	29,500	31,500
August	39,900	28,200	31,800
September	41,100	27,600	32,700
October	45,900	28,100	33,000
January–October	415,000	295,000	33,000

<sup>p</sup>Preliminary. <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>Includes ferrosilicon, miscellaneous silicon alloys, and silicon metal, excluding semiconductor and solar grades, except where noted.

<sup>3</sup>Ferrosilicon production includes material consumed in the production of miscellaneous silicon alloys.

TABLE 2  
 PRICES FOR FERROSILICON AND SILICON METAL IN OCTOBER 2014

	Low	Average	High	Average low, mid, and high
<b>Ferrosilicon:</b>				
50% ferrosilicon <sup>1</sup>	cents per pound of contained silicon	106.00	XX	110.00
75% ferrosilicon <sup>2</sup>	do.	98.00	99.00	100.00
Silicon metal, 553 grade <sup>3</sup>	cents per pound	143.00	145.40	148.00

do. Ditto. XX Not applicable.

<sup>1</sup>CRU Ryan's Notes, North American transaction price, duty paid, f.o.b. Pittsburgh, producing plant or Chicago/Pittsburgh warehouse. Average price reported for price range.

<sup>2</sup>Platts Metals Week, in U.S. warehouse, U.S. origin and imported material. Average prices reported for all transactions during the month.

<sup>3</sup>Platts Metals Week, duty paid, delivered Midwest, U.S. spot and imported 553 grade silicon metal (minimum 98.50% silicon). Average price reported for all transactions during the month.

TABLE 3  
U.S. EXPORTS OF FERROSILICON AND SILICON METAL IN OCTOBER 2014<sup>1,2</sup>

(Metric tons, unless otherwise specified)

Country	Gross weight	Contained weight	Value	January–October <sup>3</sup>		
				Gross weight	Contained weight	Value
<b>Ferrosilicon:</b>						
<b>More than 55% silicon:</b>						
Belgium	--	--	--	20	15	\$27,600
Brazil	9	6	\$14,800	34	21	59,400
Canada	211	127	329,000	3,510	2,110	5,480,000
Colombia	--	--	--	52	38	137,000
France	--	--	--	20	15	26,600
India	--	--	--	56	34	25,800
Japan	--	--	--	932	720	1,450,000
Mexico	227	137	579,000	2,090	1,290	5,040,000
Turkey	--	--	--	5	4	11,700
United Kingdom	--	--	--	95	64	125,000
Other (3 countries)	--	--	--	10	6	20,200
<b>Total</b>	<b>448</b>	<b>269</b>	<b>923,000</b>	<b>6,830</b>	<b>4,320</b>	<b>12,400,000</b>
<b>Other ferrosilicon:</b>						
Belgium	20	10	38,200	399	188	740,000
Brazil	20	10	43,400	191	95	438,000
Canada	365	183	394,000	1,190	594	1,630,000
France	80	34	37,600	140	62	65,800
Korea, Republic of	60	27	85,500	576	252	687,000
Mexico	58	29	134,000	922	395	2,160,000
Netherlands	--	--	--	380	169	208,000
Poland	--	--	--	203	58	446,000
Turkey	120	54	238,000	1,930	879	3,840,000
United Kingdom	101	50	162,000	460	225	618,000
Other (7 countries)	61	28	132,000	296	138	608,000
<b>Total</b>	<b>884</b>	<b>424</b>	<b>1,260,000</b>	<b>6,690</b>	<b>3,060</b>	<b>11,400,000</b>
<b>Total ferrosilicon</b>	<b>1,330</b>	<b>693</b>	<b>2,190,000</b>	<b>13,500</b>	<b>7,370</b>	<b>23,800,000</b>
<b>Metal:</b>						
<b>More than 99.99% silicon:</b>						
China	2,120	2,120	57,700,000	10,000	10,000	283,000,000
Germany	-4	-4	33,600	4,020	4,020	139,000,000
Hong Kong	101	101	2,810,000	754	754	22,300,000
Italy	33	33	1,650,000	252	252	14,100,000
Japan	1,360	1,360	62,900,000	9,700	9,700	498,000,000
Korea, Republic of	132	132	6,200,000	2,440	2,440	114,000,000
Malaysia	19	19	3,070,000	355	355	41,500,000
Norway	--	--	--	245	245	11,600,000
Singapore	-4	-4	4,300	1,050	1,050	18,400,000
Taiwan	380	380	12,200,000	4,650	4,650	152,000,000
Other (39 countries)	28	28	1,960,000	382	382	24,200,000
<b>Total</b>	<b>4,160</b>	<b>4,160</b>	<b>148,000,000</b>	<b>33,900</b>	<b>33,900</b>	<b>1,320,000,000</b>
<b>99.00%–99.99% silicon:</b>						
China	--	--	--	23	23	56,800
India	--	--	--	1	1	5,760
Japan	--	--	--	2	2	3,150
Mexico	4	4	10,500	58	57	161,000
Saudi Arabia	--	--	--	9	8	12,000
Taiwan	--	--	--	4	4	18,100
Thailand	--	--	--	7	7	9,650
Turkey	--	--	--	9	9	12,600
<b>Total</b>	<b>4</b>	<b>4</b>	<b>10,500</b>	<b>112</b>	<b>111</b>	<b>279,000</b>
<b>Other silicon:</b>						
Austria	--	--	--	21	21	28,200

See footnotes at end of table.

TABLE 3—Continued  
U.S. EXPORTS OF FERROSILICON AND SILICON METAL IN OCTOBER 2014<sup>1,2</sup>

(Metric tons, unless otherwise specified)

Country	Gross weight	Contained weight	Value	January–October <sup>3</sup>		Value
				Gross weight	Contained weight	
Metal—Continued:						
Other silicon:						
Belgium	--	--	--	133	129	\$143,000
Canada	24	23	\$94,400	987	959	2,640,000
China	18	18	24,100	69	67	91,300
Germany	1	1	12,000	34	33	59,100
Korea, Republic of	--	--	--	113	110	187,000
Mexico	-4	-4	5,590	478	465	1,520,000
South Africa	--	--	--	59	57	119,000
Taiwan	--	--	--	26	25	250,000
United Kingdom	1	1	6,890	78	76	182,000
Others (13 countries)	2	2	5,800	43	42	167,000
Total	46	45	149,000	2,040	1,980	5,390,000
Total silicon metal	4,210	4,210	148,000,000	36,100	36,000	1,330,000,000

-- Zero.

<sup>1</sup>Presentation of monthly data is based on the "January–October" quantities (gross weight) of the leading countries.

<sup>2</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>3</sup>May include revisions to previously published data.

<sup>4</sup>Less than 1/2 unit

Source: U.S. Census Bureau.

TABLE 4  
U.S. IMPORTS OF FERROSILICON AND SILICON METAL IN OCTOBER 2014<sup>1,2</sup>

(Metric tons, unless otherwise specified)

Country	Gross weight	Contained weight	Value	January–October <sup>3</sup>		
				Gross weight	Contained weight	Value
<b>Ferrosilicon:</b>						
55%–80% silicon, more than 3% Ca:						
Brazil	--	--	--	296	223	\$455,000
Canada	3	2	\$6,330	41	27	67,600
China	1,150	861	1,440,000	6,430	4,830	8,240,000
France	51	31	125,000	213	134	530,000
Germany	--	--	--	22	15	27,900
Norway	--	--	--	41	28	136,000
South Africa	54	36	100,000	450	307	930,000
Total	1,260	931	1,670,000	7,500	5,560	10,400,000
55%–80% silicon, other:						
Brazil	54	30	64,800	1,870	1,380	2,640,000
Canada	951	694	2,360,000	8,990	6,570	22,200,000
China	11,200	8,510	15,000,000	64,800	48,900	88,300,000
France	327	231	979,000	2,120	1,440	6,280,000
Iceland	1,410	1,100	1,870,000	10,300	7,880	14,500,000
India	100	78	231,000	884	690	1,890,000
Russia	--	--	--	65,800	50,300	95,900,000
South Africa	54	40	79,600	1,760	1,280	3,310,000
Spain	1,600	1,200	2,450,000	4,760	3,600	7,560,000
Venezuela	--	--	--	10,400	7,800	14,700,000
Other (6 countries)	72	50	227,000	2,370	1,750	6,360,000
Total	15,800	11,900	23,300,000	174,000	132,000	264,000,000
80%–90% ferrosilicon, Germany	--	--	--	151	125	147,000
<b>Magnesium ferrosilicon:</b>						
Argentina	133	63	147,000	1,010	475	1,160,000
Brazil	462	211	775,000	1,180	535	1,990,000
Canada	1,140	524	2,330,000	10,800	4,930	20,600,000
China	68	30	140,000	515	231	972,000
France	--	--	--	1	(4)	2,600
Germany	27	13	49,700	57	27	107,000
India	245	118	436,000	1,900	914	3,310,000
Norway	286	139	561,000	2,740	1,320	5,560,000
Total	2,360	1,100	4,430,000	18,300	8,430	33,700,000
<b>Other ferrosilicon:</b>						
Brazil	24	13	40,500	44	23	72,000
Canada	999	313	1,140,000	11,200	3,900	13,100,000
China	20	11	43,900	461	253	875,000
Germany	--	--	--	23	9	106,000
Poland	--	--	--	38	17	60,700
Russia	20	9	30,100	46	22	69,900
Vietnam	--	--	--	199	151	280,000
Total	1,060	346	1,260,000	12,000	4,370	14,600,000
Total ferrosilicon	20,500	14,300	30,600,000	212,000	150,000	322,000,000
<b>Metal:</b>						
More than 99.99% silicon:						
Brazil	--	--	--	489	489	1,460,000
China	9	9	186,000	70	70	1,660,000
Germany	128	128	5,960,000	893	893	48,900,000
Italy	1	1	10,600	7	7	383,000
Japan	1	1	280,000	128	128	11,100,000
Korea, Republic of	--	--	--	19	19	1,230,000
Norway	--	--	--	6	6	361,000
Singapore	--	--	--	2	2	18,800

See footnotes at end of table.

TABLE 4—Continued  
U.S. IMPORTS OF FERROSILICON AND SILICON METAL IN OCTOBER 2014<sup>1,2</sup>

(Metric tons, unless otherwise specified)

Country	Gross weight	Contained weight	Value	January–October <sup>3</sup>		
				Gross weight	Contained weight	Value
Metal—Continued:						
Spain	-4	-4	\$3,030	4	4	\$40,500
Taiwan	9	9	228,000	67	67	1,870,000
Other (9 countries)	(4)	(4)	67,000	5	5	936,000
Total	149	149	6,730,000	1,690	1,690	68,000,000
99.00%–99.99% silicon:						
Australia	1,320	1,310	3,710,000	15,000	14,700	40,700,000
Brazil	1,810	1,800	4,880,000	26,900	26,600	71,500,000
Canada	370	320	953,000	4,900	4,820	12,300,000
France	--	--	--	3,200	3,180	9,050,000
Laos	--	--	--	540	535	1,400,000
Malaysia	--	--	--	120	119	270,000
Norway	616	611	2,170,000	5,790	5,740	19,600,000
South Africa	1,260	1,250	3,620,000	28,800	28,600	78,400,000
Spain	--	--	--	1,220	1,210	3,250,000
Thailand	400	396	1,030,000	5,810	5,770	13,400,000
Other (6 countries)	38	22	99,600	178	83	389,000
Total	5,810	5,710	16,500,000	92,500	91,400	250,000,000
Other silicon:						
Australia	312	307	968,000	792	780	2,340,000
Belgium	--	--	--	21	21	47,100
Brazil	1,290	1,260	3,410,000	7,570	7,450	19,600,000
Canada	1,550	1,530	3,970,000	10,700	10,600	28,000,000
China	46	5	50,000	237	107	319,000
France	20	20	40,800	514	508	1,350,000
Norway	19	19	48,900	617	598	1,190,000
South Africa	25	25	71,100	65	64	168,000
Thailand	--	--	--	216	213	546,000
United Kingdom	-4	-4	3,000	36	34	90,700
Other (4 countries)	-4	-4	11,200	54	39	155,000
Total	3,270	3,160	8,570,000	20,900	20,400	53,800,000
Total silicon metal	9,230	9,020	31,800,000	115,000	114,000	372,000,000

-- Zero.

<sup>1</sup>Presentation of monthly data is based on the "January–October" quantities (gross weight) of the leading countries.

<sup>2</sup>Data are rounded to no more than three significant digits; may not add to totals shown.

<sup>3</sup>May include revisions to previously published data.

<sup>4</sup>Less than ½ unit.

Source: U.S. Census Bureau.