

# Mineral Industry Surveys

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## SILICON IN DECEMBER 2021

Domestic production of silicon materials was 32,600 metric tons (t) in December 2021, 7% less than November 2021 production and 9% more than December 2020 production (fig. 1, table 1). Net shipments were 26,600 t, 16% more than shipments in November 2021 and 22% more than those in December 2020. Total production and net shipments during 2021 were 14% more and 8% more, respectively, than those in 2020 (fig. 1; table 1).

Ending stocks were 14,200 t in December 2021, 12% less than ending stocks in November 2021. Owing to domestic physical inventory adjustments, these were 23% less than those in December 2020 (fig. 1; table 1).

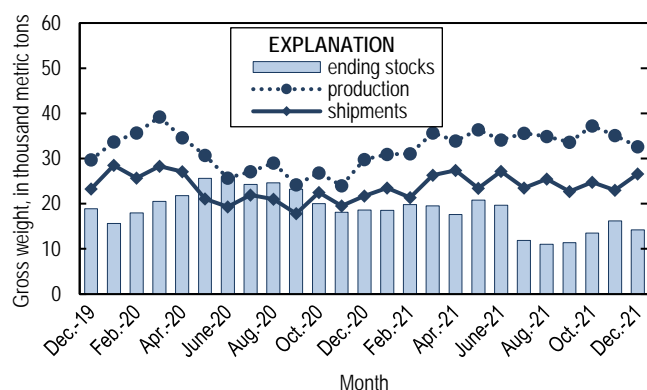


Figure 1. Monthly domestic production of total silicon materials, net shipments, and ending stocks from December 2019 through December 2021 (may include revisions to previously published data).

In December 2021, the leading recipients for silicon metal, more than 99.99% silicon trade category, were Japan, Germany, and Vietnam, in descending order (table 3). For full year 2021, the leading recipients were Japan, Taiwan, and Germany, in descending order.

In December 2021, the leading import sources for silicon metal, 99.00%–99.99% silicon trade category, were Brazil, Canada, and Thailand, in descending order (table 4). For full year 2021, the leading recipients were Brazil, Canada, and Norway, in descending order.

In December 2021, the leading import sources for ferrosilicon, 55%-80% grade, were Russia, Brazil, and Canada, in descending order (table 4). For full year 2021, the leading recipients were Russia, Brazil, and Malaysia, in descending order.

Adjustments in stocks included in-plant consumption of ferrosilicon to produce magnesium ferrosilicon and other alloys. All comparative statistics were calculated based on unrounded, gross-weight figures.

## Prices

The average U.S. spot price for silicon metal was 472.00 cents per pound in December 2021, slightly less than the average price in November 2021 and more than four times the average price in December 2020. The average U.S. spot price for ferrosilicon, 50% grade, was 189.00 cents per pound, unchanged since September 2021 and 84% more than the average price in December 2020. The average U.S. spot price for ferrosilicon, 75% grade, was 332.50 cents per pound, slightly less than the average price in November 2021 and more than three times that in December 2020 (fig. 2).

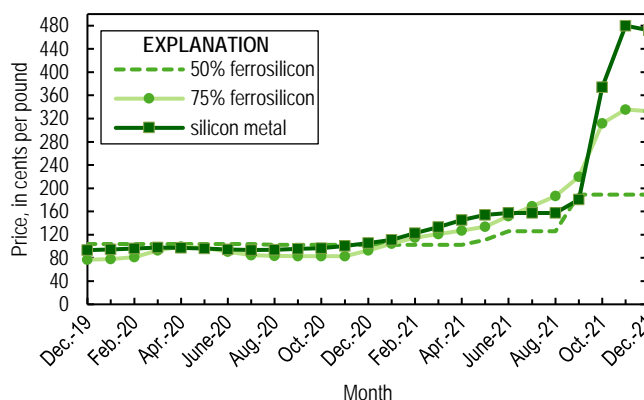


Figure 2. Average monthly spot prices for silicon metal and ferrosilicon 50% and 75% grades, contained silicon, from December 2019 through December 2021. Source: CRU Group and S&P Global Platts Metals Week.

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TABLE 1  
PRODUCTION, SHIPMENTS, AND STOCKS OF SILICON ALLOYS  
AND METAL IN THE UNITED STATES<sup>1, 2, 3</sup>

(Metric tons, gross weight)

	Gross production <sup>4</sup>	Net shipments	Producers' stocks, end of period
2020:			
January–December	360,000 <sup>r</sup>	275,000 <sup>r</sup>	18,600 <sup>r</sup>
December	29,800	21,700	18,600
2021:			
January	30,900	23,500	18,500
February	31,100	21,400	19,800
March	35,700	26,300	19,500
April	33,900	27,400	17,600
May	36,400	23,400	20,800
June	34,100	27,200	19,700
July	35,600	23,500	11,900 <sup>5</sup>
August	34,900	25,500	11,000 <sup>5</sup>
September	33,600	22,700	11,400 <sup>5</sup>
October	37,200	24,800	13,500 <sup>5</sup>
November	35,100 <sup>r</sup>	23,000 <sup>r</sup>	16,200 <sup>r, 5</sup>
December	32,600	26,600	14,200 <sup>5</sup>
January–December	411,000	295,000	14,200 <sup>5</sup>

<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>Includes U.S. Geological Survey estimates.

<sup>4</sup>Ferrosilicon production includes material consumed in the production of miscellaneous silicon alloys.

<sup>5</sup>Decreased end of period stocks attributable to domestic physical inventory adjustment.

TABLE 2  
PRICES FOR FERROSILICON AND SILICON METAL IN DECEMBER 2021

		Low	Average	High	Average low, mid, and high
Ferrosilicon:					
50% ferrosilicon <sup>1</sup>	cents per pound of contained silicon	188.00	XX	190.00	188.00–189.00–190.00
75% ferrosilicon <sup>2</sup>	do.	330.00	332.50	335.00	XX
Silicon metal, 553 grade <sup>3</sup>	cents per pound	425.00	472.00	510.00	XX

do. Ditto. XX Not applicable.

<sup>1</sup>CRU Group transaction price, duty paid, f.o.b. Pittsburgh, producing plant or Chicago/Pittsburgh warehouse. Average price reported for price range.

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

<sup>3</sup>S&P Global Platts Metals, 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 DECEMBER 2021<sup>1,2</sup>

(Metric tons, unless otherwise specified)

Country or locality	Gross weight	Contained weight	Value	January–December <sup>3</sup>		
				Gross weight	Contained weight	Value
Ferrosilicon:						
More than 55% silicon:						
Brazil	--	--	--	31	19	\$48,100
Canada	487	292	\$777,000	4,550	2,730	7,970,000
China	--	--	--	18	11	28,000
Dominican Republic	--	--	--	172	103	289,000
Germany	4	2	5,940	4	2	5,940
India	--	--	--	3	2	4,180
Japan	--	--	--	32	19	108,000
Mexico	80	48	209,000	1,370	866	3,070,000
Poland	10	6	27,800	13	8	33,100
Singapore	--	--	--	15	9	25,600
Other [2 countries and (or) localities]	2	1	2,510	4	2	11,900
Total	582	349	1,020,000	6,210	3,770	11,600,000
Other ferrosilicon:						
Belgium	--	--	--	719	326	703,000
Brazil	38	19	76,000	539	269	1,060,000
Canada	35	13	98,100	257	114	696,000
India	--	--	--	57	28	84,700
Mexico	304	148	831,000	3,750	1,840	7,710,000
Spain	60	30	161,000	297	148	579,000
Sweden	--	--	--	100	45	186,000
Switzerland	--	--	--	320	141	569,000
Turkey	60	26	135,000	560	253	1,050,000
United Kingdom	--	--	--	358	163	679,000
Other [5 countries and (or) localities]	--	--	--	115	45	151,000
Total	496	236	1,300,000	7,070	3,370	13,500,000
Total ferrosilicon	1,080	585	2,320,000	13,300	7,140	25,100,000
Metal:						
More than 99.99% silicon:						
China	366	366	12,100,000	3,690	3,690	93,400,000
Germany	500	500	13,000,000	5,730	5,730	132,000,000
Japan	1,280	1,280	54,300,000	19,000	19,000	464,000,000
Korea, Republic of	110	110	5,860,000	4,190	4,190	115,000,000
Malaysia	20	20	3,200,000	2,350	2,350	67,100,000
Netherlands	--	--	--	315	315	409,000
Norway	53	53	996,000	1,030	1,030	24,400,000
Singapore	159	159	3,300,000	1,600	1,600	33,300,000
Taiwan	210	210	3,330,000	6,560	6,560	68,100,000
Vietnam	403	403	13,700,000	5,580	5,580	115,000,000
Other [41 countries and (or) localities]	41	41	1,940,000	541	541	21,700,000
Total	3,140	3,140	112,000,000	50,600	50,600	1,130,000,000
99.00%–99.99% silicon:						
Belgium	39	38	46,500	39	38	46,500
China	--	--	--	12	12	16,900
Dominican Republic	--	--	--	15	15	45,000
France	--	--	--	51	51	72,400
Germany	--	--	--	209	208	331,000
Japan	--	--	--	8	7	10,600
Korea, Republic of	3	3	3,760	44	43	48,600
Mexico	--	--	--	27	19	100,000
Netherlands	--	--	--	365	364	281,000
United Arab Emirates	--	--	--	48	48	576,000
Other [8 countries and (or) localities]	2	2	2,850	19	19	26,400
Total	43	43	53,100	838	825	1,550,000

See footnotes at end of table.

TABLE 3—Continued  
U.S. EXPORTS OF FERROSILICON AND SILICON METAL IN DECEMBER 2021<sup>1, 2</sup>

(Metric tons, unless otherwise specified)

Country or locality	Gross weight	Contained weight	Value	January–December <sup>3</sup>		
				Gross weight	Contained weight	Value
Metal—Continued:						
Other silicon:						
Belgium	3	3	\$30,700	320	311	\$448,000
Canada	5	4	6,010	70	68	224,000
China	--	--	--	317	308	419,000
Germany	--	--	--	73	71	104,000
India	--	--	--	106	104	560,000
Japan	--	--	--	228	222	2,050,000
Mexico	132	128	1,060,000	210	204	1,680,000
Netherlands	--	--	--	128	124	157,000
South Africa	--	--	--	86	84	135,000
Taiwan	--	--	--	57	54	230,000
Other [14 countries and (or) localities]	7	6	8,710	90	87	214,000
Total	146	142	1,110,000	1,680	1,640	6,220,000
Total silicon metal	3,330	3,330	113,000,000	53,100	53,100	1,140,000,000

-- Zero.

<sup>1</sup>Presentation of monthly data is based on the quantities (gross weight) of the leading countries and (or) localities.

<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.

Source: U.S. Census Bureau.

TABLE 4  
U.S. IMPORTS OF FERROSILICON AND SILICON METAL IN DECEMBER 2021<sup>1,2</sup>

(Metric tons, unless otherwise specified)

Country or locality	Gross weight	Contained weight	Value	January–December <sup>3</sup>		
				Gross weight	Contained weight	Value
Ferrosilicon:						
55%–80% silicon, more than 3% Ca:						
China	--	--	--	160	99	\$364,000
France	16	9	\$36,200	391	235	1,090,000
Germany	--	--	--	1	1	2,120
Russia	--	--	--	8	4	19,600
South Africa	--	--	--	53	34	117,000
Total	16	9	36,200	613	372	1,600,000
55%–80% silicon, other:						
Brazil	1,770	1,330	3,700,000	21,000	15,900	30,500,000
Canada	1,180	856	2,420,000	12,500	9,090	26,700,000
Egypt	179	133	415,000	1,690	1,170	4,140,000
Iceland	332	251	1,400,000	6,240	4,790	13,000,000
Kazakhstan	--	--	--	13,100	10,000	26,200,000
Malaysia	196	147	283,000	17,000	12,500	38,300,000
Norway	239	178	524,000	6,370	4,900	10,700,000
Paraguay	150	112	464,000	2,090	1,560	2,860,000
Russia	7,340	5,570	37,900,000	66,200	50,300	193,000,000
South Africa	106	79	189,000	2,470	1,760	4,080,000
Other [13 countries and (or) localities]	457	332	919,000	4,710	3,440	9,760,000
Total	11,900	9,000	48,300,000	153,000	115,000	359,000,000
80%–90% ferrosilicon, Germany	--	--	--	27	22	25,500
More than 90% ferrosilicon:						
Canada	--	--	--	1	1	18,000
China	--	--	--	15	14	59,100
Total	--	--	--	16	15	77,100
Magnesium ferrosilicon:						
Argentina	--	--	--	323	114	284,000
Brazil	343	153	688,000	1,250	521	1,760,000
Canada	841	388	1,570,000	11,600	5,340	20,300,000
China	25	13	60,700	66	33	155,000
Germany	35	16	60,300	164	70	352,000
India	88	40	172,000	614	280	1,150,000
Norway	--	--	--	24	12	60,300
Panama	--	--	--	49	22	36,700
Russia	71	33	140,000	171	81	416,000
South Africa	--	--	--	130	61	85,200
Total	1,400	643	2,690,000	14,400	6,530	24,600,000
Other ferrosilicon:						
Canada	697	228	887,000	7,910	2,550	10,300,000
China	--	--	--	58	26	83,900
France	--	--	--	38	18	101,000
Germany	3	1	16,100	44	19	112,000
Mexico	--	--	--	11	5	31,200
Russia	--	--	--	142	68	304,000
Slovakia	81	36	155,000	444	160	793,000
South Africa	--	--	--	85	11	125,000
Spain	--	--	--	25	11	42,500
Total	781	265	1,060,000	8,760	2,870	11,900,000
Total ferrosilicon	14,100	9,910	52,000,000	177,000	125,000	397,000,000

See footnotes at end of table.

TABLE 4—Continued  
U.S. IMPORTS OF FERROSILICON AND SILICON METAL IN DECEMBER 2021<sup>1,2</sup>

(Metric tons, unless otherwise specified)

Country or locality	Gross weight	Contained weight	Value	January–December <sup>3</sup>		
				Gross weight	Contained weight	Value
Metal—Continued:						
More than 99.99% silicon:						
Brazil	117	117	\$323,000	1,450	1,450	\$3,530,000
China	4	4	966,000	55	55	5,350,000
Germany	56	56	5,140,000	552	552	56,100,000
Japan	1	1	368,000	156	156	11,000,000
Korea, Republic of	(4)	(4)	3,150	25	25	538,000
Malaysia	--	--	--	86	86	994,000
Norway	3	3	50,000	10	10	158,000
Taiwan	14	14	1,790,000	470	470	47,700,000
Thailand	40	40	100,000	444	444	1,200,000
Vietnam	--	--	--	96	96	272,000
Other [11 countries and (or) localities]	1	1	177,000	12	12	1,960,000
Total	236	236	8,920,000	3,350	3,350	129,000,000
99.00%–99.99% silicon:						
Australia	17	17	56,600	3,270	3,250	8,080,000
Brazil	4,190	4,160	12,100,000	28,100	27,900	66,000,000
Canada	2,600	2,590	6,370,000	27,100	26,900	65,100,000
China	--	--	--	6	6	24,500
Germany	80	79	182,000	91	90	215,000
Malaysia	50	50	101,000	166	165	315,000
Norway	264	262	737,000	8,260	8,200	21,300,000
Switzerland	--	--	--	116	115	307,000
Thailand	844	839	2,640,000	5,240	5,200	13,700,000
Vietnam	--	--	--	67	67	165,000
Other [2 countries and (or) localities]	--	--	--	(4)	(4)	13,700
Total	8,050	8,000	22,200,000	72,400	71,900	175,000,000
Other silicon:						
Australia	246	236	809,000	2,970	2,890	7,780,000
Brazil	1,890	1,830	4,070,000	9,470	9,280	22,100,000
China	2	2	4,540	299	287	373,000
France	20	20	69,200	391	378	760,000
Germany	(4)	(4)	2,250	233	226	680,000
Japan	29	28	31,600	202	194	249,000
Netherlands	191	183	251,000	274	263	486,000
Norway	343	337	654,000	6,230	6,060	10,800,000
Thailand	--	--	--	336	331	602,000
United Kingdom	17	16	18,000	459	440	507,000
Other [8 countries and (or) localities]	--	--	--	595	576	1,420,000
Total	2,730	2,650	5,910,000	21,400	20,900	45,700,000
Total silicon metal	11,000	10,900	37,000,000	97,200	96,200	350,000,000

-- Zero.

<sup>1</sup>Presentation of monthly data is based on the quantities (gross weight) of the leading countries and (or) localities.

<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.