SILICON

(Data in thousand metric tons of silicon content unless otherwise noted)

Domestic Production and Use: Estimated value of silicon metal and alloys (excluding semiconductor-grade silicon) produced in the United States in 2006 was about $354 million. Five companies produced silicon materials in six plants. Of those companies, four produced ferrosilicon in four plants. Silicon metal was produced by two companies in four plants. Two of the five companies in the industry produced both products at two plants. All of the active ferrosilicon and silicon metal plants were east of the Mississippi River. Most ferrosilicon was consumed in the ferrous foundry and steel industries, predominantly in the eastern half of the United States. The main consumers of silicon metal were producers of aluminum and aluminum alloys and the chemical industry. The semiconductor industry, which manufactures chips for computers from high-purity silicon, accounted for only a few percent of silicon demand.

Salient Statistics—United States:	2002	2003	2004	2005	2006[e]
Production:					
Ferrosilicon, all grades[1]	150	117	128	125	143
Silicon metal	111	136	147	145	W
Imports for consumption					
Ferrosilicon, all grades[1]	140	189	173	197	220
Silicon metal	145	126	165	152	147
Exports:					
Ferrosilicon, all grades[1]	7	6	6	8	5
Silicon metal	15	20	18	23	27
Consumption, apparent:					
Ferrosilicon, all grades[1]	301	304	297	317	356
Silicon metal	240	240	291	275	W
Price,[2] average, cents per pound Si:					
Ferrosilicon, 50% Si	41.1	47.7	58.2	55.0	62
Ferrosilicon, 75% Si	32.8	45.3	55.4	48.0	54
Silicon metal	53.2	61.3	81.9	76.2	77
Stocks, producer, yearend:					
Ferrosilicon, all grades[1]	21	17	15	13	14
Silicon metal	4	5	7	6	W
Net import reliance[3] as a percentage of apparent consumption:					
Ferrosilicon, all grades[1]	50	62	57	61	60
Silicon metal	54	43	50	47	≤50

Recycling: Insignificant.

Import Sources (2002-05): Ferrosilicon: China, 26%; Venezuela, 20%; Russia, 11%; Norway, 9%; and other, 34%. Silicon metal: Brazil, 37%; South Africa, 25%; Canada, 14%; Norway, 6%; and other, 18%. Total: Brazil, 20%; China, 16%; South Africa, 13%; Canada, 12%; and other, 39%.

Tariff: Item	Number	Normal Trade Relations 12-31-06
Ferrosilicon, 55%-80% Si:		
More than 3% Ca	7202.21.1000	1.1% ad val.
Other	7202.21.5000	1.5% ad val.
Ferrosilicon, 80%-90% Si	7202.21.7500	1.9% ad val.
Ferrosilicon, more than 90% Si	7202.21.9000	5.8% ad val.
Ferrosilicon, other:		
More than 2% Mg	7202.29.0010	Free.
Other	7202.29.0050	Free.
Silicon, more than 99.99% Si	2804.61.0000	Free.
Silicon, 99.00%-99.99% Si	2804.69.1000	5.3% ad val.
Silicon, other	2804.69.5000	5.5% ad val.

Depletion Allowance: Quartzite, 15% (Domestic and foreign); gravel, 5% (Domestic and foreign).

Government Stockpile: None.

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SILICON

Events, Trends, and Issues: Domestic ferrosilicon production in 2006, expressed in terms of contained silicon, was expected to increase by 14% from that in 2005. The number of silicon metal producers in the United States fell to two from three during 2006, as one of the existing companies acquired another. As a result, U.S. silicon metal statistics have been withheld to avoid disclosing company proprietary data. Through the first 10 months of 2005, spot market prices trended upward in the U.S. market for silicon materials owing primarily to increased demand for ferrosilicon materials in the summer and disruptions in domestic silicon metal production coupled with high energy costs.

Demand for silicon metal comes primarily from the aluminum and chemical industries. In the first 8 months of 2006, domestic chemical production was nearly unchanged compared with that in 2005. Domestic primary aluminum production was projected to decrease by 7% in 2006. Domestic apparent consumption of ferrosilicon in 2006 was projected to increase by 17% compared with that of 2005. The annual growth rate for ferrosilicon demand usually falls in the range of 1% to 2%, in line with long-term trends in steel production, but through the first 8 months of 2006, domestic steel production was 10% higher than that for the same period in 2005.

World Production, Reserves, and Reserve Base:

	Production[e, 4]		Reserves and reserve base[5]
	2005	2006	
United States	270	[6]143	The reserves and reserve base in most major producing countries are ample in relation to demand. Quantitative estimates are not available.
Brazil	226	230	
Canada	66	60	
China	2,360	2,400	
France	139	140	
Iceland	78	78	
India	36	36	
Kazakhstan	68	70	
Norway	278	270	
Russia	526	600	
South Africa	131	130	
Spain	55	55	
Ukraine	161	140	
Venezuela	60	60	
Other countries	289	310	
World total (rounded)	4,720	4,700	

Ferrosilicon accounts for about four-fifths of world silicon production (gross-weight basis).The leading countries for ferrosilicon production, in descending order of production, were China, Russia, Norway, Ukraine, and Brazil, and for silicon metal, China, Brazil, and Norway. China was by far the leading producer of both ferrosilicon and silicon metal. An estimated 550,000 tons of silicon metal is included in China's production of silicon materials for 2006.

World Resources: World and domestic resources for making silicon metal and alloys are abundant, and, in most producing countries, adequate to supply world requirements for many decades. The source of the silicon is silica in various natural forms, such as quartzite.

Substitutes: Aluminum, silicon carbide, and silicomanganese can be substituted for ferrosilicon in some applications. Gallium arsenide and germanium are the principal substitutes for silicon in semiconductor and infrared applications.

[e]Estimated. W Withheld to avoid disclosing company proprietary data.
[1]Ferrosilicon grades include the two standard grades of ferrosilicon—50% and 75%—plus miscellaneous silicon alloys.
[2]Based on U.S. dealer import price.
[3]Defined as imports – exports + adjustments for Government and industry stock changes.
[4]Production quantities are combined totals of estimated silicon content for ferrosilicon and silicon metal, as applicable, except as noted.
[5]See Appendix C for definitions.
[6]Ferrosilicon only.