

DIAMOND (INDUSTRIAL)

(Data in million carats unless otherwise noted)

Domestic Production and Use: In 2009, domestic production of industrial diamond was estimated to be approximately 260 million carats, and the United States was one of the world's leading markets. All domestic output was synthetic grit and powder. Two firms, one in Pennsylvania and another in Ohio, accounted for all of the production. Nine firms produced polycrystalline diamond from diamond powder. Three companies recovered used industrial diamond as one of their principal operations. The following industry sectors were the major consumers of industrial diamond: computer chip production, construction, machinery manufacturing, mining services (drilling for mineral, oil, and gas exploration), stone cutting and polishing, and transportation systems (infrastructure and vehicles). Stone cutting and highway building and repair consumed most of the industrial stone. About 98% of the U.S. industrial diamond market now uses synthetic industrial diamond because its quality can be controlled and its properties can be customized to fit specific requirements.

Salient Statistics—United States:	2005	2006	2007	2008	2009^e
Bort, grit, and dust and powder; natural and synthetic:					
Production:					
Manufactured diamond ^e	256	258	260	261	260
Secondary	4.6	34.2	34.4	33.9	33.9
Imports for consumption	284	371	411	492	229
Exports ¹	92	90	107	116	73.8
Sales from Government stockpile excesses	—	—	—	—	—
Consumption, apparent	453	573	598	670	449
Price, value of imports, dollars per carat	0.27	0.22	0.19	0.15	0.16
Net import reliance ² as a percentage of apparent consumption	42	49	51	56	35
Stones, natural:					
Production:					
Mine	—	—	—	—	—
Secondary	0.53	0.56	0.38	0.36	0.36
Imports for consumption ³	2.1	2.2	3.1	3.22	1.3
Exports ¹	(4)	(4)	—	(4)	—
Sales from Government stockpile excesses	—	(4)	(4)	0.47	—
Consumption, apparent	2.2	2.8	3.5	4.05	1.7
Price, value of imports, dollars per carat	13.91	12.61	11.54	12.89	12.18
Net import reliance ² as a percentage of apparent consumption	77	80	89	91	78

Recycling: In 2009, the amount of diamond bort, grit, and dust and powder recycled was estimated to be 33.9 million carats. Lower prices of newly produced industrial diamond appear to be reducing the number and scale of diamond stone recycling operations. In 2009, it was estimated that 359,000 carats of diamond stone was recycled.

Import Sources (2005-08): Bort, grit, and dust and powder; natural and synthetic: China, 57%; Ireland, 24%; Russia, 6%; Republic of Korea, 5%; and other, 8%. Stones, primarily natural: Botswana, 39%; South Africa, 23%; Namibia, 12%; India, 7%; and other, 19%.

Tariff: Item	Number	Normal Trade Relations 12-31-09
Industrial Miners' diamonds, carbonados	7102.21.1010	Free.
Industrial Miners' diamonds, other	7102.21.1020	Free.
Industrial diamonds, simply sawn, cleaved, or bruted	7102.21.3000	Free.
Industrial diamonds, not worked	7102.21.4000	Free.
Industrial diamonds, other	7102.29.0000	Free.
Grit or dust and powder of natural or synthetic diamonds	7105.10.0000	Free.

Depletion Allowance: 14% (Domestic and foreign).

Government Stockpile: National Defense Stockpile sales held during fiscal year 2008 depleted all remaining inventory of industrial diamond stone.

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Events, Trends, and Issues: China is the world's leading producer of synthetic industrial diamond, with annual production exceeding 4 billion carats. The United States is likely to continue to be one of the world's leading markets for industrial diamond into the next decade and likely will remain a significant producer and exporter of synthetic industrial diamond as well. Owing to the negative impact of the economic recession on U.S. manufacturing sectors that utilize industrial diamond, imports in 2009 declined significantly compared with those of 2008. U.S. demand for industrial diamond is likely to continue in the construction sector as the United States continues building and repairing the Nation's highway system. Industrial diamond coats the cutting edge of saws used to cut cement in highway construction and repair work.

During 2009, work to further develop and improve the chemical vapor deposition (CVD) method of growing nearly 100%-pure diamond using microwave plasma technology continued and made this method of diamond synthesis more economical.

Demand for synthetic diamond grit and powder is expected to remain greater than for natural diamond material. Constant-dollar prices of synthetic diamond products probably will continue to decline as production technology becomes more cost effective; the decline is even more likely if competition from low-cost producers in China and Russia continues to increase.

World Mine Production and Reserves:⁵

	Mine production		Reserves ⁶
	2008	2009 ^e	
United States	—	—	NA
Australia	15	14	95
Botswana	8	8	130
China	1	1	10
Congo (Kinshasa)	22	22	150
Russia	15	15	40
South Africa	8	8	70
Other countries	<u>3</u>	<u>3</u>	<u>85</u>
World total (rounded)	72	71	580

World Resources: Natural diamond resources have been discovered in more than 35 countries. Natural diamond accounts for about 12% of all industrial diamond used, while synthetic diamond accounts for the remainder. At least 15 countries have the technology to produce synthetic diamond.

Substitutes: Materials that can compete with industrial diamond in some applications include manufactured abrasives, such as cubic boron nitride, fused aluminum oxide, and silicon carbide. Synthetic diamond rather than natural diamond is used for about 88% of industrial applications.

^eEstimated. NA Not available. — Zero.

¹Reexports no longer are combined with exports because increasing amounts of U.S. reexports obscure apparent consumption rates.

²Defined as imports – exports + adjustments for Government and industry stock changes.

³May include synthetic miners' diamond.

⁴Less than ½ unit.

⁵Natural industrial diamond only. Note that synthetic diamond production far exceeds natural industrial diamond output. Worldwide production of manufactured industrial diamond totaled at least 4.55 billion carats in 2009; the leading producers included China, Ireland, Japan, Russia, South Africa, and the United States.

⁶See [Appendix C for definitions](#). Reserve base estimates were discontinued in 2009; see [Introduction](#).