

DIAMOND (INDUSTRIAL)

(Data in million carats unless otherwise noted)

Domestic Production and Use: In 2008, domestic production of industrial diamond was estimated to be approximately 261 million carats, and the United States remained the world's leading market. 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. Four 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 94% 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:	2004	2005	2006	2007	2008^e
Bort, grit, and dust and powder; natural and synthetic:					
Production:					
Manufactured diamond ^e	252	256	258	260	261
Secondary	4.6	4.6	34.2	34.4	34.4
Imports for consumption	240	284	371	411	493
Exports ¹	86	92	90	107	122
Sales from Government stockpile excesses	—	—	—	—	—
Consumption, apparent	411	453	573	598	666
Price, value of imports, dollars per carat	0.25	0.27	0.22	0.19	0.12
Net import reliance ² as a percentage of apparent consumption	38	42	49	51	56
Stones, natural:					
Production:					
Mine	—	—	—	—	—
Secondary	(3)	0.53	0.56	0.38	0.38
Imports for consumption ⁴	1.8	2.1	2.2	3.1	3.8
Exports ¹	0.5	(3)	(3)	—	(3)
Sales from Government stockpile excesses	0.4	—	(3)	(3)	0.5
Consumption, apparent	2.1	2.2	2.8	3.5	4.6
Price, value of imports, dollars per carat	7.77	13.91	12.61	11.54	10.41
Net import reliance ² as a percentage of apparent consumption	80	77	80	89	92

Recycling: In 2008, the amount of diamond bort, grit, and dust and powder recycled was estimated to be 34.4 million carats. Lower prices of newly produced industrial diamond appear to be reducing the number and scale of diamond stone recycling operations. In 2008, it was estimated that 383,000 carats of diamond stone was recycled.

Import Sources (2004-07): Bort, grit, and dust and powder; natural and synthetic: China, 40%; Ireland, 26%; Russia, 6%; Republic of Korea, 5%; and other, 23%. Stones, primarily natural: Botswana, 32%; South Africa, 21%; Namibia, 11%; Ireland, 7%; and other, 29%.

Tariff: Item	Number	Normal Trade Relations 12-31-08
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).

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Government Stockpile: During fiscal year 2008, the Department of Defense sold 473,406 carats of industrial diamond stone from the National Defense Stockpile for \$8.22 million. Although 520,000 carats were authorized for disposal, this depleted all remaining inventory of industrial diamond stone.

Stockpile Status—9-30-08⁵

Material	Uncommitted inventory	Authorized for disposal	Disposal plan FY 2008	Disposals FY 2008
Industrial stones	—	0.520	0.520	0.473

Events, Trends, and Issues: The United States is likely to continue to be the world's leading market for industrial diamond into the next decade and likely will remain a significant producer and exporter of synthetic industrial diamond as well. Increase in 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.

One U.S. research group has developed a fast chemical vapor deposition (CVD) method of growing nearly 100%-pure diamond using microwave plasma technology. The greatest potential for CVD diamond will be in computer applications, where it will be able to function as a semiconductor at much higher speeds and temperatures than silicon.

World demand for diamond grit and powder will continue growing. 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 increasing.

World Mine Production, Reserves, and Reserve Base:⁶

	Mine production		Reserves ⁷	Reserve base ⁷
	2007	2008 ^e		
United States	—	—	NA	NA
Australia	19	18	90	230
Botswana	8	8	130	230
China	1	1	10	20
Congo (Kinshasa)	22	23	150	350
Russia	15	15	40	65
South Africa	9	9	70	150
Other countries	<u>3</u>	<u>3</u>	<u>85</u>	<u>210</u>
World total (rounded)	77	77	580	1,300

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.

³Less than ½ unit.

⁴May include synthetic miners' diamond.

⁵[See Appendix B for definitions.](#)

⁶Natural industrial diamond only. Note, however, that synthetic diamond production far exceeds natural industrial diamond output. Worldwide production of manufactured industrial diamond totaled at least 568 million carats in 2008; the leading producers included Ireland, Japan, Russia, South Africa, and the United States.

⁷[See Appendix C for definitions.](#)