

## DIAMOND (INDUSTRIAL)

(Data in million carats unless otherwise noted)

**Domestic Production and Use:** In 2012, total domestic production of industrial diamond was estimated to be 104 million carats, and the United States was one of the world's leading markets. Domestic output was synthetic grit, powder, and stone. 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. Total domestic secondary production of industrial diamond was estimated to be 37 million carats. 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, milling, and repair consumed most of the industrial diamond stone. About 97% 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.

<b>Salient Statistics—United States:</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012<sup>e</sup></b>
Bort, grit, and dust and powder; natural and synthetic:					
Production:					
Manufactured diamond <sup>e</sup>	48.3	38.3	39.3	41.5	44
Secondary	33.9	33.5	33.4	34.7	37
Imports for consumption	492	246	596	726	630
Exports <sup>1</sup>	116	67	113	148	160
Consumption, apparent	458	251	556	654	550
Price, value of imports, dollars per carat	0.15	0.17	0.14	0.13	0.13
Net import reliance <sup>2</sup> as a percentage of apparent consumption	82	71	87	88	85
Stones, natural and synthetic:					
Production:					
Manufactured diamond <sup>e</sup>	83.1	52.7	53.7	56.7	60
Secondary	0.36	0.46	0.46	0.31	0.33
Imports for consumption <sup>3</sup>	3.22	1.4	1.72	2.46	2.8
Exports <sup>1</sup>	—	—	—	—	—
Sales from Government stockpile excesses	0.47	—	—	—	—
Consumption, apparent	87.1	54.6	55.9	59.4	63
Price, value of imports, dollars per carat	12.89	13.31	18.78	19.67	12.90
Net import reliance <sup>2</sup> as a percentage of apparent consumption	4	3	3	4	4

**Recycling:** In 2012, the amount of diamond bort, grit, and dust and powder recycled was estimated to be 37 million carats. Lower prices of newly produced industrial diamond appear to be reducing the number and scale of diamond stone recycling operations. In 2012, it was estimated that 330,000 carats of diamond stone was recycled.

**Import Sources (2008–11):** Bort, grit, and dust and powder; natural and synthetic: China, 77%; Ireland, 12%; Republic of Korea, 4%; Russia, 3%; and other, 4%. Stones, primarily natural: Botswana, 45%; South Africa, 22%; India, 11%; Namibia, 8%; and other, 14%.

<b>Tariff: Item</b>	<b>Number</b>	<b>Normal Trade Relations 12–31–12</b>
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:** None.

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**Events, Trends, and Issues:** In 2012, China was 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. U.S. demand for industrial diamond is likely to continue in the construction sector as the United States continues building, milling, 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.

Demand for synthetic diamond grit and powder is expected to remain greater than that 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:**<sup>4</sup>

	Mine production		Reserves <sup>5</sup>
	2011	2012 <sup>e</sup>	
United States	—	—	NA
Australia	8	8	110
Botswana	23	24	130
China	1	1	10
Congo (Kinshasa)	16	16	150
Russia	15	15	40
South Africa	4	4	70
Other countries	<u>10</u>	<u>10</u>	<u>85</u>
World total (rounded)	<u>77</u>	<u>78</u>	<u>600</u>

**World Resources:** Natural diamond resources have been discovered in more than 35 countries. Natural diamond accounts for about 3% 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. Globally, synthetic diamond rather than natural diamond is used for about 99% of industrial applications.

<sup>e</sup>Estimated. NA Not available. — Zero.

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

<sup>2</sup>Defined as imports – exports + adjustments for Government and industry stock changes.

<sup>3</sup>May include synthetic miners' diamond.

<sup>4</sup>Natural industrial diamond only. Note that synthetic diamond production far exceeds natural industrial diamond output. Worldwide production of manufactured industrial diamond totaled at least 4.4 billion carats in 2012; the leading producers included Belarus, China, Ireland, Japan, Russia, South Africa, Sweden, and the United States.

<sup>5</sup>See Appendix C for resource/reserve definitions and information concerning data sources.