

## HELIUM

(Data in million cubic meters of contained helium gas<sup>1</sup> unless otherwise noted)

**Domestic Production and Use:** During 2005, the estimated value of Grade-A helium (99.995% or better) extracted domestically by private industry was about \$350 million. Ten industry plants (six in Kansas and four in Texas) extracted helium from natural gas and produced only a crude helium product that varied from 50% to 80% helium. Ten industry plants (four in Kansas, and one each in Texas, Colorado, New Mexico, Oklahoma, Utah, and Wyoming) extracted helium from natural gas and produced an intermediate process stream of crude helium (about 70% helium and 30% nitrogen) and continued processing the stream to produce a Grade-A helium product. Six industry plants (four in Kansas, one in Oklahoma, and one in Texas) accepted a crude helium product from other producers and the Bureau of Land Management (BLM) pipeline and purified it to a Grade-A helium product. Estimated 2005 domestic consumption of 85 million cubic meters (3.1 billion cubic feet) was used for cryogenic applications, 28%; for pressurizing and purging, 26%; for welding cover gas, 20%; for controlled atmospheres, 13%; leak detection, 4%; breathing mixtures, 2%; and other, 7%.

<b>Salient Statistics—United States:</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>2005<sup>e</sup></b>
Helium extracted from natural gas <sup>2</sup>	87	87	87	86	84
Withdrawn from storage <sup>3</sup>	45	40	35	44	50
Grade-A helium sales	132	127	122	130	134
Imports for consumption	—	—	—	—	—
Exports <sup>4</sup>	43.0	40.0	41.0	44.9	49.4
Consumption, apparent <sup>4</sup>	88.9	87.6	80.7	85.1	84.6
Employment, plant, number <sup>e</sup>	325	325	325	325	325
Net import reliance <sup>5</sup> as a percentage of apparent consumption	E	E	E	E	E

**Price:** The Government price for crude helium was \$1.965 per cubic meter (\$54.50 per thousand cubic feet) in fiscal year (FY) 2005. The price for the Government-owned helium is mandated by the Helium Privatization Act of 1996 (Public Law 104-273). The estimated price range for private industry's Grade-A gaseous helium was about \$2.42 to \$2.63 per cubic meter (\$67 to \$73 per thousand cubic feet), with some producers posting surcharges to this price.

**Recycling:** In the United States, helium used in large-volume applications is seldom recycled. Some low-volume or liquid boiloff recovery systems are used. In Western Europe and Japan, helium recycling is practiced when economically feasible.

**Import Sources (2001-04):** None.

<b>Tariff: Item</b>	<b>Number</b>	<b>Normal Trade Relations</b>
Helium	2804.29.0010	<u>12-31-05</u> 3.7% ad val.

**Depletion Allowance:** Allowances are applicable to natural gas from which helium is extracted, but no allowance is granted directly to helium.

**Government Stockpile:** Under the Public Law 104-273, the BLM manages the Federal Helium Program, which includes all operations of the Cliffside helium storage reservoir and the Government's crude helium pipeline system. The BLM no longer supplies Federal agencies with Grade-A helium. Private firms that sell Grade-A helium to Federal agencies are required to purchase a like amount of crude helium (in-kind) from the BLM.

In FY 2005, privately owned companies purchased nearly 6.9 million cubic meters (247 million cubic feet) of in-kind crude helium. In addition to this, the privately owned companies also purchased 21.9 million cubic meters (790 million cubic feet) of open market sales helium. During FY 2005, BLM's Amarillo Field Office, Helium Operations (AMFO) accepted about 16.7 million cubic meters (603 million cubic feet) of private helium for storage and redelivered nearly 72.5 million cubic meters (2.613 billion cubic feet). As of September 30, 2005, 27.8 million cubic meters (1.0 billion cubic feet) of helium was owned by private firms.

<b>Material</b>	<b>Stockpile Status—9-30-05<sup>6</sup></b>			<b>Disposal plan FY 2005</b>	<b>Disposals FY 2005</b>
	<b>Uncommitted inventory</b>	<b>Committed inventory</b>	<b>Authorized for disposal</b>		
Helium	717.2	16.6	717.2	63.8	28.8

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**Events, Trends, and Issues:** During FY 2005, a number of companies including all the major helium producers again announced helium price increases of 8% to 15%. They stated that helium price increases were required to offset increases in crude helium, electric power, natural gas, labor, fuel, distribution, and transportation costs. In addition to price increases, some of the companies implemented surcharges and eliminated discounts on monthly charges for helium tube trailers. It is anticipated that the cost of helium will continue to rise along with increasing production costs as U.S. helium reserves are depleted. Even with escalating helium prices, it is expected that helium demand will continue to grow slowly at about 2.5% to 3.5% per year. Based on helium export totals through July 2005, calendar year 2005 exports are expected to increase by 8% to 10% from 2004 exports. During FY 2005, the AMFO conducted two open market helium sales. Sales of helium for the two open market offers totaled 21.9 million cubic meters (790 million cubic feet). The two overseas helium projects at Skikda, Algeria, and Qatar are still scheduled to come onstream by the end of 2005 or early 2006. The Skikda helium expansion project, designed to increase helium production capacity by 16.6 million cubic meters (600 million cubic feet) per year, will come onstream at about one-half capacity of about 8.3 million cubic meters (300 million cubic feet). The Qatar project, a new helium extraction facility, will have a helium production capacity of 8.3 million cubic meters (300 million cubic feet) per year.

### **World Production, Reserves, and Reserve Base:**

	Production		Reserves <sup>8</sup>	Reserve base <sup>8</sup>
	2004	2005 <sup>e</sup>		
United States (extracted from natural gas)	86	84	3,600	<sup>9</sup> 8,400
United States (from Cliffside Reserve)	44	50	—	—
Algeria	16	17	1,900	8,400
Canada	NA	NA	NA	2,000
China	NA	NA	NA	1,100
Poland	3	3	32	280
Qatar	NA	NA	NA	10,000
Russia	5	6	1,700	6,700
Other countries	NA	NA	NA	2,800
World total (rounded)	154	160	NA	39,700

**World Resources:** The identified helium resources of the United States were estimated to be about 8.5 billion cubic meters (305 billion cubic feet) as of January 1, 2003. This includes 0.87 billion cubic meters (31.4 billion cubic feet) of helium stored in the Cliffside Field Government Reserve (these resources are included in the Reserves and Reserve base figures above), 3.7 billion cubic meters (133 billion cubic feet) of helium in helium-rich natural gas (0.30% helium or more) from which helium is currently being extracted, and 3.1 billion cubic meters (112 billion cubic feet) in helium-lean natural gas (less than 0.30% helium). The Hugoton (Kansas, Texas, and Oklahoma), Panhandle West, Panoma, Riley Ridge, and Cliffside Fields are currently depleting gasfields and contain an estimated 3.6 billion cubic meters (130 billion cubic feet) of helium. Future helium supplies will probably come from known helium-rich natural gas with little fuel value and from helium-lean gas resources.

Helium resources of the world exclusive of the United States were estimated to be about 31.1 billion cubic meters (1.121 trillion cubic feet). The locations and volumes of the major deposits, in billion cubic meters, are Qatar, 10; Algeria, 8; Russia, 7; Canada, 2; and China, 1. As of December 31, 2005, AMFO had analyzed more than 21,600 gas samples from 26 countries and the United States in a program to identify world helium resources.

**Substitutes:** There is no substitute for helium in cryogenic applications if temperatures below  $-429^{\circ}$  F are required. Argon can be substituted for helium in welding, and hydrogen can be substituted for helium in some lighter-than-air applications in which the flammable nature of hydrogen is not objectionable. Hydrogen is also being investigated as a substitute for helium in deep-sea diving applications below 1,000 feet.

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

<sup>1</sup>Measured at 101.325 kilopascals absolute (14.696 psia) and 15° C, 27.737 cubic meters of helium = 1 Mcf of helium at 70° F and 14.7 psia.

<sup>2</sup>Helium from both Grade-A and crude helium.

<sup>3</sup>Extracted from natural gas in prior years (injected in parentheses).

<sup>4</sup>Grade-A helium.

<sup>5</sup>Defined as imports – exports + adjustments for Government and industry stock changes.

<sup>6</sup>[See Appendix B for definitions.](#)

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<sup>8</sup>[See Appendix C for definitions.](#)

<sup>9</sup>All domestic measured and indicated helium resources in the United States.