

HELIUM

(Data in million cubic meters of contained helium gas¹ unless otherwise noted)

Domestic Production and Use: The estimated value of Grade-A helium (99.995% or better) extracted domestically during 2007 by private industry was about \$525 million. Nine industry plants (five 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 Colorado, Oklahoma, New Mexico, Texas, 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 2007 domestic consumption of 70.4 million cubic meters (2.5 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%.

Salient Statistics—United States:	2003	2004	2005	2006	2007^e
Helium extracted from natural gas ²	87	86	76	79	80
Withdrawn from storage ³	35	44	57	58	58
Grade-A helium sales	122	130	133	137	138
Imports for consumption	—	—	—	—	—
Exports ⁴	41.3	44.9	51.4	61.9	67.7
Consumption, apparent ⁴	80.7	85.1	81.6	75.2	70.4
Employment, plant, number ^e	325	325	325	325	325
Net import reliance ⁵ as a percentage of apparent consumption	E	E	E	E	E

Price: The Government price for crude helium was \$2.12 per cubic meter (\$58.75 per thousand cubic feet) in fiscal year (FY) 2007. 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 \$3.24 to \$3.79 per cubic meter (\$90 to \$105 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 (2003-06): None.

Tariff: Item	Number	Normal Trade Relations
Helium	2804.29.0010	<u>12-31-07</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 Public Law 104-273, the BLM manages the Federal Helium Program, which includes all operations of the Cliffside Field helium storage reservoir, located in Potter County, TX, 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 (in-kind) crude helium from the BLM.

In FY 2007, privately owned companies purchased nearly 7.1 million cubic meters (256 million cubic feet) of in-kind crude helium. In addition to this, privately owned companies also purchased 57.2 million cubic meters (2,062 million cubic feet) of open market sales helium. During FY 2007, BLM's Amarillo Field Office, Helium Operations (AMFO), accepted about 15.5 million cubic meters (557 million cubic feet) of private helium for storage and redelivered nearly 76.1 million cubic meters (2,742 million cubic feet). As of September 30, 2007, about 37.2 million cubic meters (1,343 million cubic feet) of privately owned helium remained in storage at Cliffside Field.

Stockpile Status—9-30-07⁶

Material	Uncommitted inventory	Committed inventory	Authorized for disposal	Disposal plan FY 2007	Disposals FY 2007
Helium	609.4	16.6	609.4	63.8	64.3

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Events, Trends, and Issues: During FY 2007, most helium suppliers announced price increases of 10% to 40%. These increases were implemented in response to high capacity utilization, rising raw material, energy and distribution costs, and to support reinvestment in cylinders, production, and distribution equipment. In addition to price increases, some of the companies increased high-pressure cylinder rental charges, while others will continue cost-recovery efforts through various charges and surcharges. It is anticipated that the factors that have caused the price of pure helium to increase will continue in the near term, along with increasing production and crude helium costs as U.S. helium reserves continue to be depleted. Even if helium prices continue to escalate, helium demand is expected to continue to grow at about 2.5% to 3.5% per year. Based on helium export totals through August 2007, calendar year (CY) 2007 exports are expected to increase by about 9% to 10% from 2006 exports. During FY 2007, the AMFO conducted four open market helium sales. Sales totaled 57.2 million cubic meters (2,062 million cubic feet). During 2007, the two helium projects at Skikda, Algeria, and Qatar that came onstream in late 2005 continued to have operational problems resulting in production outputs substantially below capacity. This resulted in helium supply shortages and interruptions for several months in late 2006 and throughout most of 2007.

World Production, Reserves, and Reserve Base: Reserves and reserve base data were revised based on estimated production for CY 2007.

	Production		Reserves ⁸	Reserve base ⁸
	2006	2007 ^e		
United States (extracted from natural gas)	79	80	3,400	⁹ 8,200
United States (from Cliffside Field)	58	58	(¹⁰)	(¹⁰)
Algeria	15	20	1,800	8,300
Canada	NA	NA	NA	2,000
China	NA	NA	NA	1,100
Poland	3	3	26	280
Qatar	4.4	5.5	NA	10,000
Russia	6.3	6.4	1,700	6,700
Other countries	NA	NA	NA	2,800
World total (rounded)	166	173	NA	39,000

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 billion cubic meters (1.1 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, 2007, AMFO had analyzed over 21,800 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° 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.

^eEstimated. E Net exporter. NA Not available. — Zero.

¹Measured 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.

²Helium from both Grade-A and crude helium.

³Extracted from natural gas in prior years.

⁴Grade-A helium.

⁵Defined as imports – exports + adjustments for Government and industry stock changes.

⁶[See Appendix B for definitions.](#)

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⁸[See Appendix C for definitions.](#)

⁹All domestic measured and indicated helium resources in the United States.

¹⁰Included in United States (extracted from natural gas) reserves and reserve base.