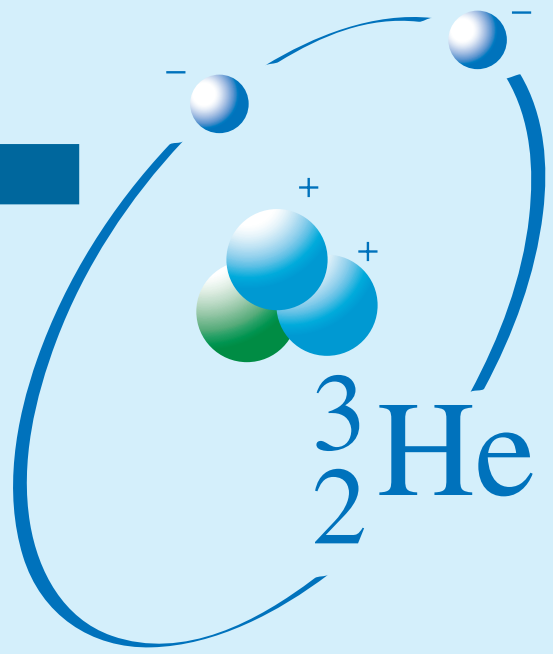
Helium - 3

H e l i u m - 3

Used for :

- Neutron detectors, proportional counters
- Ring laser gyro inertial navigation systems
- Cryogenics, cryostats, ultra low temperature systems
- Hyperpolarized gas M.R.I.
- Research and development laboratories
- Fundamental physics



Gas description

Helium-3 is a stable and lighter isotope of natural helium. It is an inert, nontoxic and nonflammable gas. Il is colorless, tasteless and ordorless. Helium-3 is osbtained from tranformation of tritium ^3H into ^3He after β (beta) emission.

Helium-3 purity specifications

	U.H.P. Grade	H.P. Grade	S.T.D. Grade	CRYO Grade
^3He (atom %) isotopic enrichment	**> 99.995%**	**≥ 99.991%**	**≥ 99.95%**	**≥ 99.8%**
$^4He + ^3He$ (atom %) chemical purity	> 99.9995%	≥ 99.999%	> 99.998%	≥ 99.995%
^4He (atom %)	< 0.005%	≤ 0.009%	≤ 0.05%	≤ 0.2%
Tritium (atom %)	$< 8x10^{-12}$	$< 8x10^{-12}$	$< 1x10^{-12}$	$< 1x10^{-11}$
Typical impurities (in ppm)				
N_2	< 1	≤ 1	< 5	< 6
$Ar + O_2$	< 1	≤ 1	< 3	< 6
THC	< 1	≤ 1	< 1	< 6
$CO + CO_2$	< 1	≤ 1	≤ 2	< 6
Ne	< 1	≤ 1	< 1	< 6
H_2	< 1	≤ 1.5	≤ 5	≤ 6

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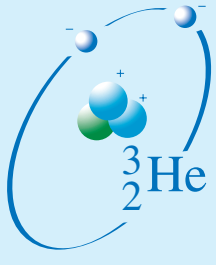
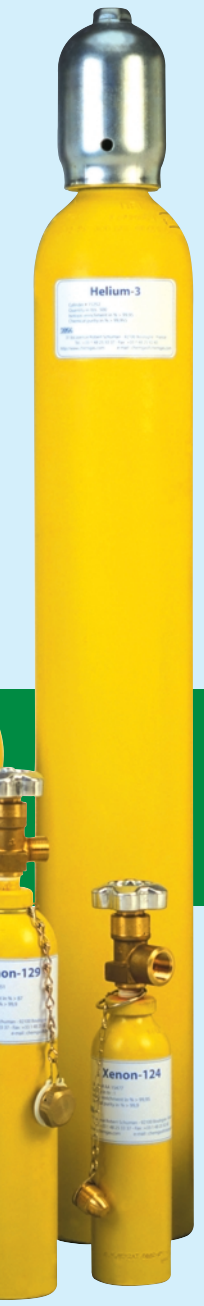


Cylinders information

Light alloy cylinders equipped with brass diaphram valves specially designed for high purity gases.

Cylinders	Volume in ltrs	Type of outlet connections
B5	5.15	DIN 477, BS3, CGA 580 or C
B1	1.02	DIN 477, BS3, CGA 580 or C
B04	0.42	DIN 477, BS3, CGA 580 or C

Other types of cylinders (carbon steel cylinders, stainless steel cylinders) and other outlet connections (CGA 170 connection, 1/4 "NPT connection...) are available on request.



Outlet connections

Physical constants

Atomic Number	3
Half-life	stable
Number of Protons	2
Number of Neutron	1

The ^{3}He nucleus contains a single neutron which gives a nuclear spin. Spin (Jπ) : 1/2+

% Abondance	0.0001373
Molecular Weight	3 016029.310 +/- 0.001

Compressibility factor (z)

Pressure in bar	1	5	10	20	30	50	100	150	200
Z at 288°K (15°C)	1.0005	1.0024	1.0049	1.0098	1.0147	1.0244	1.0487	1.0727	1.0965
Z at 323°K (50°C)	1.004	1.022	1.0043	1.0086	1.0129	1.0125	1.0429	1.0641	1.0851

Boiling Point : -269.96°C (3.19°K)
Critical point : -269.82°C (3.33°K)
Density at 21.1°C (70°F) : 0.1650 kg/m³
Freezing point at 1 atm : none

Vapour pressure at 21.1°C (70°F) : N/A
Mass excess (keV) : 14931.204 +/- 0.001
Binding energy (keV) : 7718.058 +/- 0.002

Shipping information

UN number (compressed gas) : UN 1046
Helium, compressed
Class : 2.2
C.A.S. number : 7440-59-7
Hazard label(s) : non-flammable gas, Passenger aircraft

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