

# Pure Gas: Helium-3

## DESCRIPTION

Helium-3 is a stable and lighter isotope of ordinary Helium. It is odorless, colorless and tasteless. The natural abundance of Helium-3 is  $1.38 \times 10^{-6}$ . Helium-3 is principally shipped and used in gaseous form for detectors, NMR tracers, spectroscopy, low temperature physics, lasers, dilution refrigerators and R & D laboratories research. Spectra Gases Material Safety Data Sheets (MSDS) are available for Helium-3 gas and should be used as guidelines in regard to first aid, methods of storage, handling and general use of Helium-3.

PURITY SPECIFICATIONS (MAXIMUM IMPURITY LEVELS)*		
Contaminant	Spectra Grade Chemical Purity 99.999% Isotopic Enrichment 99.99%	UHP Grade Chemical Purity 99.999% Isotopic Enrichment 99.9%
Argon (Ar)	0.5 ppm	1.0 ppm
Carbon Dioxide (CO <sub>2</sub> )	0.5 ppm	0.5 ppm
Helium-4 (He)	100.0 ppm	1000.0 ppm
Nitrogen (N <sub>2</sub> )	0.5 ppm	0.5 ppm
Oxygen (O <sub>2</sub> )	1.0 ppm	1.0 ppm
Water (H <sub>2</sub> O)	0.1 ppm	0.1 ppm

\* Higher purities are available upon request.

CYLINDER INFORMATION					
Purity	Cylinder Size*	Valve Outlet*	Volume Liters	Gross Weight Lbs/Kg	Pressure Psig/Bar
Spectra Grade	D1	580	400	13 / 6	1625 / 113
	D2	580	200	9 / 4	1250 / 87
	D2	580	100	9 / 4	600 / 42
	D3	580	50	6 / 3	725 / 51
	D3	580	25	6 / 3	350 / 25
	LB	580/170	47	6 / 3	1800 / 125
UHP Grade	D1	580	400	13 / 6	1625 / 113
	D2	580	200	9 / 4	1250 / 87
	D2	580	100	9 / 4	600 / 42
	D3	580	50	6 / 3	725 / 51
	D3	580	25	6 / 3	350 / 25
	LB	580/170	47	6 / 3	1800 / 125

\* Additional cylinder sized and/or valve outlets are available upon request.

(Continued)



PHYSICAL CONSTANTS	
Chemical name	<sup>3</sup> He
Molecular weight	3.01603
Boiling point	-452.1°F, -268.9°C
Half Life	Stable
Mass excess MeV	14.9313
Mass excess uMu	16.030
Critical temperature	-452.1°F, -268.9°C
Critical pressure	2.7 psia, 0.186 bar
Frequency at 11.75T	380.99 MHZ
Spin (h/2Π)	½ +
Thermal neutron cross section	σ <sub>p</sub> , 5.33(1) x 10 <sup>3</sup>
Nuclear magnetic moment (NM)	-2.12762
Vapor pressure	N/A
LEL%	N/A
VEL%	N/A

SHIPPING DATA	
Chemical formula	<sup>3</sup> He
CAS Register Number	7440-59-7
DOT Classification	Nonflammable gas
DOT Label	Nonflammable gas
Transport Canada Classification	2.2
Substance Identification (SI)	1046
UN Number	UN 1046
Hazards	High Pressure and suffocation
Toxicity (TLV)	Asphyxiant
Flammability Range (in air)	Nonflammable gas
Odor	None