

Pure Gas: Hydrogen

DESCRIPTION

Hydrogen gas is colorless, odorless, tasteless, flammable, and nontoxic. It exists as a gas at ambient temperatures and atmospheric pressures. It is the lightest gas known with a density approximately 0.07 that of air. The concentration of Hydrogen in the atmosphere volume is 5.0 x 10⁻⁵%. Hydrogen is principally shipped and used in gaseous form for refineries, petrochemical companies for hydrotreating, catalytic reforming and hydrocracking. Hydrogen is also used in heat treating, metal production, welding, lasers, plastics, food production and semiconductors. Spectra Gases Material Safety Data Sheets (MSDS) are available for hydrogen gas and should be used as guidelines in regard to first aid, methods of storage, handling and general use of Hydrogen.

PURITY SPECIFICATIONS (MAXIMUM IMPURITY LEVELS)*		
Contaminant	Research Grade 99.9999%	UHP Grade 99.999%
Argon (Ar)	0.1 ppm	1.0 ppm
Carbon Dioxide (CO ₂)	0.1 ppm	1.0 ppm
Carbon Monoxide (CO)	0.5 ppm	1.0 ppm
Nitrogen (N ₂)	0.1 ppm	3.0 ppm
Oxygen (O ₂)	0.1 ppm	2.0 ppm
Total Hydrocarbons (THC)	0.1 ppm	1.0 ppm
Water (H ₂ O)	0.2 ppm	3.0 ppm

* Higher purities are available upon request.

CYLINDER INFORMATION					
Purity	Cylinder Size*	Valve Outlet*	Volume Cu.Ft./Liters	Gross Weight Lbs/Kg	Pressure Psig/Bar
Research Grade	1	580	261.0 / 7400	138 / 63	2400 / 167
	2	580	219.0 / 6200	116 / 53	2265 / 157
	3	580	073.0 / 2100	047 / 21	2000 / 139
	4	580	038.0 / 1100	022 / 10	2000 / 139
	LB	170	001.7 / 50	006 / 03	1800 / 125
UHP Grade	1	580	261.0 / 7400	138 / 63	2400 / 167
	2	580	219.0 / 6200	116 / 53	2265 / 157
	3	580	073.0 / 2100	047 / 21	2000 / 139
	LB	170	0 1.7 / 50	006 / 03	1800 / 125
Non-Refillable Cylinders	D1	580	— / 0400	18 / 8	1625 / 113
	D2	580	— / 0200	12 / 5	1250 / 087
	D2	580	— / 0100	10 / 4	0600 / 042
	D3	580	— / 0050	07 / 3	0725 / 051
	D3	580	— / 0025	07 / 3	0350 / 025

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

(Continued)



PHYSICAL CONSTANTS	
Chemical name	H2
Molecular weight	2.016
Density of the gas at 70°F (21,1°C), 1 atm	0.00521 lb/ft ³ , 0.08342 kg/m ³
Specific gravity of the gas at 32°F (0°C), 1 atm	0.06960
Specific volume of the gas at 70°F (21,1°C), 1 atm	192.0 ft ³ /lb, 11.99 m ³ /kg
Boiling point at 1 atm	-423.0°F, -252.8°C
Melting point at 1 atm	-434.55°F, -259.2°C
Critical temperature at 1 atm	-399.93°F, -239.96°C
Critical pressure	190.8 psia, 13.15 bar
Critical density	1.88 lb/ft ³ , 30.12 kg/m ³
Triple point at 1.045 psia (0.072)	-434.55°F, -259.2°C
Latent heat of vaporization at normal boiling point	191.7 Btu/lb, 446.0 kJ/kg
Latent heat of fusion at triple point	24.97 Btu/lb, 58.09 kJ/kg
Specific heat of the gas at 70°F (21,1°C), 1 atm	Cp 3.425 Btu/(lb) (°F) 14.34 kJ/(kg) (°C)
	Cv 2.418 Btu/(lb) (°F) 10.12 kJ/(kg) (°C)
Ratio of specific heats (C p/C v)	1.42

SHIPPING DATA	
Synonyms	H2
CAS Register Number	1333-74-0
DOT Classification	Flammable gas
DOT Label	Flammable gas
Transport Canada Classification	2.1
Substance Identification (SI)	1049
UN Number	UN 1049
Hazards	Fire and High Pressure
Toxicity (TLV)	Asphyxiant
Flammability Range (in air)	4.0% - 75%
Odor	None