

ELECTRONIC GAS

PHOSPHINE PH₃

Phosphine is a highly toxic, flammable, colorless gas with an odor similar to that of decaying fish. It is subject to spontaneous combustion. It is used as phosphorus (N-type dopant) source in chemical vapor deposition and ion implantation. It is also used in gallium arsenide as an ion implantation gas in the manufacturer of light emitting diodes (LED). It is shipped as a liquefied gas under its own vapor pressure.

Container Information

CYLINDER SIZE	CONTENTS		Pressure @ 21.1°C Valve Outlet	593 psig CGA-350 / DISS-632
	LB	KG		
049	30	13.6	DOT Shipping Description: Phosphine, 2.3, UN 2199 Poison-Inhalation Hazard Hazard Zone A	Phosphine, 2.3, UN 2199 Poison-Inhalation Hazard Hazard Zone A
016	9	4.1		
4X	400g		DOT Guide No. CAS Registry No.	18 7803-51-2
7X	30g			

Specifications

COMPONENT PHOSPHINE	ULSI 99.9999% min	VLSI 99.9995% min	ELECTRONIC 99.999% min
Argon	100 ppb	500 ppb	1 ppm
Arsine	100 ppb	100 ppb	1 ppm
Carbon Dioxide	100 ppb	100 ppb	1 ppm
Carbon Monoxide	100 ppb	100 ppb	0.5 ppm
Nitrogen	200 ppb	1000 ppb	3 ppm
Oxygen	100 ppb	100 ppb	1 ppm
THC (as Methane)	100 ppb	100 ppb	1 ppm
Water	200 ppb	1000 ppb	1 ppm

SHELF LIFE: 18 months

Physical Properties

Molecular Weight	34.00
Flammability Limits in air	Not Available
Specific Gravity, Gas @ 70°F(21.1°C), 1 atm(Air=1)	1.18
Density, Gas @ 70°F(21.1°C), 1 atm	0.0955lbs/ft ³ (1.53g/l)
Specific Volume, Gas @ 70°F(21.1°C), 1 atm	11.41ft ³ /lb (0.712l/g)
Boiling Point @ 1 atm	-125.9°F (-87.7°C)
Melting Point @ 1 atm	-208.8°F (-133.8°C)
Critical Temperature	124.9°F (51.6°C)
Critical Pressure	947.9 psia (65.4 bar)
Toxicity	
PEL/TLV	0.3 ppm
STEL	1 ppm
LC ₅₀	20 ppm
IDLH	200 ppm

VLSI Metals Specifications

ELEMENT	SYMBOL	GAS PHASE	LIQUID PHASE
Antimony	Sb	< 2	< 25
Cadmium	Cd	< 2	< 10
Calcium	Ca	< 2	< 100
Chromium	Cr	< 100	< 200
Cobalt	Co	< 2	< 10
Copper	Cu	< 2	< 100
Gallium	Ga	< 1	< 10
Germanium	Ge	< 2	< 10
Iron	Fe	< 50	< 500
Lead	Pb	< 2	< 10
Lithium	Li	< 2	< 10
Magnesium	Mg	< 10	< 100
Manganese	Mn	< 50	< 200
Molybdenum	Mo	< 20	< 100
Nickel	Ni	< 50	< 500
Potassium	K	< 2	< 10
Selenium	Se	< 2	< 10
Silicon	Si	< 10	< 50
Sodium	Na	< 10	< 200
Tin	Sn	< 10	< 50
Zinc	Zn	< 2	< 50

*all values in ppb, lot analysis only