

ELECTRONIC GAS

PHOSPHINE PH₃ MIXTURES

Phosphine can be diluted with argon, helium, hydrogen or nitrogen in order to provide concentrations of less than 100%. Using Phosphine in this form can add an additional degree of control to the process, particularly when relatively small amounts of phosphorous are to be deposited.

Description										
CYLINDER CONNECTION: CGA-350 / DISS-632										
DOPING CONCENTRATIONS can be mixed with ULSI or VLSI grade balance gases										
Phosphine Concentration	Cylinder Size	Pressure psig	Argon		Helium		Hydrogen		Nitrogen	
			ft ³	m ³	ft ³	m ³	ft ³	m ³	ft ³	m ³
5 ppm - 23%	044	1800	200	5.66	175	4.95	175	4.95	187	5.30
	016	1800	75	2.12	66	1.87	66	2.12	70	1.98
The pressures at higher concentrations than shown above are lower than those shown due to the fact that phosphine has a low vapor pressure. Only a maximum amount can be put into a cylinder to avoid liquefaction of the phosphine. To achieve higher concentrations, less balance gases are added.										
SHELF LIFE: 1 year										

Phosphine in Silane					
Concentration	Cylinder Size	Pressure psig	Contents		
			ft ³	m ³	
1 - 20%	049	875	148	4.19	
	044	875	133	3.771	
	016	875	50	1.42	

DOT Shipping Information			
HYDROGEN BALANCE			
Conc	Shipping Name	Shipping Papers	Shipping Labels
>10%	__% Phosphine/Hydrogen Mixture Inhalation Hazard	Compressed Gases, toxic, flammable, nos (__% Phosphine/Hydrogen Mixture) 2.3 UN 1953 Poison Inhalation Hazard, Hazard Zone A	Poison Gas Flammable Gas
10% - 2%	__% Phosphine/Hydrogen Mixture Inhalation Hazard	Compressed Gases, toxic, flammable, nos (__% Phosphine/Hydrogen Mixture) 2.3 UN 1953 Poison Inhalation Hazard, Hazard Zone B	Poison Gas Flammable Gas
2% - 0.67%	__% Phosphine/Hydrogen Mixture Inhalation Hazard	Compressed Gases, toxic, flammable, nos (__% Phosphine/Hydrogen Mixture) 2.3 UN 1953 Poison Inhalation Hazard, Hazard Zone C	Poison Gas Flammable Gas
0.67% - 0.4%	__% Phosphine/Hydrogen Mixture Inhalation Hazard	Compressed Gases, toxic, flammable, nos (__% Phosphine/Hydrogen Mixture) 2.3 UN 1953 Poison Inhalation Hazard, Hazard Zone D	Poison Gas Flammable Gas
<4000 ppm	__ppm Phosphine/Hydrogen Mixture	Compressed Gases, flammable, nos (__ppm Phosphine/Hydrogen Mixture) 2.1 UN 1954	Flammable Gas
ARGON, HELIUM, NITROGEN BALANCE			
Conc	Shipping Name	Shipping Papers	Shipping Labels
>10%	__% Phosphine/____ Mixture Inhalation Hazard	Compressed Gases, toxic, flammable, nos (__% Phosphine/____ Mixture) 2.3 UN 1953 Poison Inhalation Hazard, Hazard Zone A	Poison- Gas Flammable Gas
10% - 2%	__% Phosphine/____ Mixture Inhalation Hazard	Compressed Gases, toxic, flammable, nos (__% Phosphine/____ Mixture) 2.3 UN 1953 Poison Inhalation Hazard, Hazard Zone B	Poison Gas Flammable Gas
2% - 0.7% (Ar) 2% - 0.9% (He) 2% - 1.2% (N ₂)	__% Phosphine/____ Mixture Inhalation Hazard	Compressed Gases, toxic, flammable, nos (__% Phosphine/____ Mixture) 2.3 UN 1953 Poison Inhalation Hazard, Hazard Zone C	Poison Gas Flammable Gas
0.7% - 0.67% (Ar) 0.9% - 0.67% (He) 1.2% - 0.67% (N ₂)	__% Phosphine/____ Mixture Inhalation Hazard	Compressed Gases, toxic, flammable, nos (__% Phosphine/____ Mixture) 2.3 UN 1953 Poison Inhalation Hazard, Hazard Zone C	Poison Gas
0.67% - 0.4%	__% Phosphine/____ Mixture Inhalation Hazard	Compressed Gases, toxic, flammable, nos (__% Phosphine/____ Mixture) 2.3 UN 1953 Poison Inhalation Hazard, Hazard Zone D	Poison Gas
<4000 ppm	__ppm Phosphine/____ Mixture	Compressed Gases, nos (__ppm Phosphine/____ Mixture) 2.1 UN 1954	Non-flammable Gas

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GASES