

ELECTRONIC GAS

AMMONIA NH₃

Ammonia is a colorless, pungent, non-flammable gas at atmospheric pressure and temperature. It is irritating to the mucous membranes and toxic in high concentrations. It is used as an advanced materials for the deposition of silicon nitride by chemical vapor deposition. It is shipped as a liquefied gas under its own vapor pressure.

Container Information

CYLINDER SIZE	CONTENTS		Pressure @ 21.1°C Valve Outlet	114 psig CGA-660 / DISS-720
	LB	KG		
044	50	22.7	DOT Shipping Description:	Ammonia, anhydrous, liquefied 2.2, UN 1005, Inhalation Hazard
016	15	6.8	DOT Shipping Labels DOT Guide No.	Non-flammable Gas 15
010	11	5.0	CAS Registry No.	7664-41-7

Specifications

COMPONENT	ULSI	VLSI	ELECTRONIC
AMMONIA	99.9999% min	99.9995% min	99.999% min
Carbon Dioxide	< 150 ppb		
Carbon Monoxide	< 100 ppb	< 0.5 ppm	< 1 ppm
Nitrogen	< 150 ppb	< 1 ppm	< 2 ppm
Oxygen	< 150 ppb	< 0.5 ppm	< 1 ppm
THC (as Methane)	< 100 ppb	< 0.5 ppm	< 1 ppm
Water	< 300 ppb	< 2 ppm	< 3 ppm

SHELF LIFE: 2 years

Physical Properties

Molecular Weight	17.03
Flammability Limits in air	15 - 28%
Specific Gravity, Gas @ 70°F(21.1°C), 1 atm (Air=1)	0.597
Density, Gas @ 70°F(21.1°C), 1 atm	0.04lbs/ft ³ (0.71g/l)
Specific Volume, Gas @ 70°F(21.1°C), 1 atm	22.6ft ³ /lb (1.411l/g)
Boiling Point @ 1 atm	-28.2°F (-33.4°C)
Melting Point @ 1 atm	-107.9°F (-77.7°C)
Critical Temperature	270.3°F (132.4°C)
Toxicity	
PEL	50 ppm
TLV-TWA	25 ppm
STEL	35 ppm
LC ₅₀ -RAT	7338 ppm
IDLH	500 ppm

ULSI Metals Specifications

ELEMENT	SYMBOL	GAS PHASE	LIQUID PHASE
Antimony	Sb	< 10	< 10
Cadmium	Cd	< 10	< 10
Calcium	Ca	< 10	< 50
Chromium	Cr	< 10	< 50
Cobalt	Co	< 10	< 10
Copper	Cu	< 10	< 50
Gallium	Ga	< 1	< 10
Germanium	Ge	< 10	< 10
Iron	Fe	< 50	< 500
Lead	Pb	< 10	< 10
Lithium	Li	< 1	< 1
Magnesium	Mg	< 10	< 50
Manganese	Mn	< 10	< 50
Molybdenum	Mo	< 10	< 10
Nickel	Ni	< 10	< 100
Potassium	K	< 1	< 1
Silicon	Si	< 10	< 500
Sodium	Na	< 10	< 10
Tin	Sn	< 10	< 300
Zinc	Zn	< 10	< 100

*all values in ppbw, lot analysis only