

## GAS SAFETY AND MATERIAL COMPATIBILITY DATA CHART

This data has been compiled from the best information available and is offered as a guide to proper material selection. The data presented are generalized for average conditions of temperature and pressure. The user should always investigate the characteristics of the gas being handled and take all the proper precautions. Our technical staff will be pleased to give free advice and technical information on any gas or chemical product of interest.

GAS	HAZARDS FOR HUMANS			MATERIALS OF CONSTRUCTION								SPECIAL CHARACTERISTICS
	Toxic	Flammable	Corrosive	Aluminum	Copper	Brass	Steel	Stainless Steel	Monel®	Kel-F®	Teflon®	
Acetylene		◇		R	N	R	R	R		R	R	Do not use at pressures exceeding 15psig
Air				R	R	R	R	R	R	R	R	
Ammonia	◇	◇	◇	R	N	N	X	R		R	R	Causes stress cracking of copper and copper alloys
Argon				R	R	R	R	R		R	R	
Arsine*	◇	◇		X	N	X	X	R		R	R	Highly toxic, excessive exposure may have delayed effect
Boron Trichloride	◇		◇	N	X	X	X	X	X	R	R	
Boron Trifluoride	◇		◇	X	R	R	R	R	R	R	R	
1-3, Butadiene		◇		R	R	R	R	R		R	R	
Butane		◇		R	R	R	R	R		R	R	
Butenes		◇		R	R	R	R	R		R	R	
Carbon Dioxide				R	R	R	R	R		R	R	
Carbon Monoxide	◇	◇		R	R	R	R	R		R	R	
Carbonyl Sulfide	◇	◇		R	N	N	X	R		R	R	Treat as Hydrogen Sulfide, affects central nervous system
Chlorine	◇		◇	N	N	N	X	X	X	R	R	Very toxic and damaging to the respiratory system
Cyanogen*	◇	◇		X			R	R		R	R	Treat as cyanides
Deuterium		◇		R	R	R	R	R		R	R	
Dimethylamine	◇	◇	◇	X	N	N	R	R		X	R	Attacks copper and copper alloys rapidly.
Dimethyl Ether		◇		R	R	R	R	R		R	R	
Ethane		◇		R	R	R				R	R	
Ethyl Chloride	◇	◇				R	R	R		R	R	
Ethylene		◇		R	R	R	R	R		R	R	
Ethylene Oxide	◇	◇			N	N	R	R		R	R	Exposure of liquid on skin or clothing can cause dermatitis
Fluorine*	◇		◇	R	R	X		R	R	N	X	Strong oxidant, can ignite combustible materials and metals
Helium				R	R	R	R	R		R	R	
Hydrogen		◇		R	R	R	R	R		R	R	
Hydrogen Bromide	◇		◇	N	X	N	X	X	X	R	R	Steel or stainless steel serviceable in dry liquid or gas service
Hydrogen Chloride	◇		◇	N	X		X	X	X	R	R	Steel or stainless steel serviceable in dry liquid or gas service
Hydrogen Fluoride*	◇		◇	X	R	R	R	R		R	R	Exposure can attack skin, bones and fingernails
Hydrogen Selenide	◇	◇		N	N	N	X	R		R	R	Extremely toxic, odor deadens the olfactory nerves
Hydrogen Sulfide*	◇	◇		N	N	N	X	R		R	R	Odor deadens olfactory nerves, can cause paralysis
Isobutane		◇		R	R	R	R	R		R	R	
Isobutylene		◇		R	R	R	R	R		R	R	
Krypton				R	R	R	R	R		R	R	

\*It is recommended that users thoroughly familiarize themselves with the specific properties of this gas.

Middlesex Gases & Technologies, Inc.  
292 Second Street  
PO Box 490249  
Everett, MA 02149

(800) 649-6704 or (617) 387-5050  
www.MiddlesexGases.com  
Info@MiddlesexGases.com

### LEGEND

◇ - Primary Hazard      N - Not Recommended  
R - Recommended      X - Depends on conditions

## GAS SAFETY AND MATERIAL COMPATIBILITY DATA CHART

GAS	HAZARDS FOR HUMANS			MATERIALS OF CONSTRUCTION								SPECIAL CHARACTERISTICS
	Toxic	Flammable	Corrosive	Aluminum	Copper	Brass	Steel	Stainless Steel	Monel®	Kel-F®	Teflon®	
Methane	◇	◇		R	R	R	R	R		R	R	
Methyl Acetylene		◇		R	N	X	R	R		R	R	
Methyl Bromide	◇	◇		X	R	R	R	R		R	R	
Methyl Chloride	◇	◇		N	X	R	R	R		R	R	Forms explosive compounds with aluminum
Methyl Mercaptan	◇	◇		R	N	X	R	R		R	R	
Monoethylamine	◇	◇		X	N	N	R	R		X	R	Attacks copper and copper alloys rapidly
Monomethylamine	◇	◇		X	N	N	R	R		X	R	Attacks copper and copper alloys rapidly
Neon				R	R	R	R	R		R	R	
Nitric Oxide	◇		◇	R	N	N	X	R	N	R	R	Readily reacts with Oxygen to form Nitrogen Dioxide
Nitrogen				R	R	R	R	R		R	R	
Nitrosyl Chloride	◇		◇	N	N	N	N	N	R		R	Very corrosive, attacks most metals except nickel
Nitrous Oxide				R	R	R	R	R		R	R	
Oxygen*				R	R	R	R	R		R	R	Strong oxidant, ignites combustible matter spontaneously
Phosgene	◇		◇	N	N	N	X	X	R	R	R	Very toxic
Phosphine*	◇	◇		R	X	X	R	R		R	R	Highly toxic, high concentrations are pyrophoric
Propane		◇		R	R	R	R	R		R	R	
Propylene		◇		R	R	R	R	R		R	R	
Silane*	◇	◇		R	R	R	R	R		R	R	Pyrophoric
Silicon Tetrafluoride	◇		◇	R	R	R	R	R		R	R	
Sulfur Dioxide	◇		◇	R	R	R	R	R		R	R	
Sulfur Hexafluoride				R	R	R	R	R		R	R	
Sulfur Tetrafluoride	◇		◇	R	R	R	R	R		R	R	
Trimethylamine	◇	◇		R	N	N	R	R		X	R	Attacks copper and copper alloys rapidly
Xenon				R	R	R	R	R		R	R	

\*It is recommended that users thoroughly familiarize themselves with the specific properties of this gas.

All data presented are considered accurate and reliable but supplier assumes no liability or responsibility of any kind.

Middlesex Gases & Technologies, Inc.  
292 Second Street  
PO Box 490249  
Everett, MA 02149

(800) 649-6704 or (617) 387-5050  
www.MiddlesexGases.com  
Info@MiddlesexGases.com

LEGEND	
◇ - Primary Hazard	N - Not Recommended
R - Recommended	X - Depends on conditions