

**Partial list of gases with special MFC requirements**

Sulfur Dioxide (SO <sub>2</sub> )	Highly corrosive in presence of trace amounts of moisture. Delivery at low vapor pressures. Temperature drop cause liquefaction in line and MFC. Moisture and liquefaction clog bypass holes, sensors and other component parts in the gas system. Highly reactive at temperatures above 50°C.
Chlorine (CL <sub>2</sub> )	Highly corrosive in presence of trace amounts of moisture. Delivery at low vapor pressures. Temperature drop cause liquefaction in line and MFC. Moisture and liquefaction clog bypass holes, sensors and other component parts in the gas system. Leaves a deposit when liquid CL <sub>2</sub> returns to the gas phase.
Ammonia (NH <sub>3</sub> )	Corrosive when exposed to moisture and/or oxygen. Corrosion may cause particle contamination.
Boron Trichloride (BCL <sub>3</sub> )	Liquid cylinder delivery at very low vapor pressures may cause condensation in line or MFC. Moisture may cause deposits of boric acid in the gas system.
Diborane (B <sub>2</sub> H <sub>6</sub> )	Boric acid forms from exposure to moisture with subsequent powder coating of flow-path components. During periods of inactivity, trapped gas degrades into higher boranes that clog bypass holes, sensors and other component parts.
Dichlorosilane (SiH <sub>2</sub> Cl <sub>2</sub> )	Very low vapor pressure with resultant pressure control and condensation challenge. In contact with moisture, immediately hydrolyzes to HCl and silicon dioxide.
Hydrogen Bromide (HBr)	Highly corrosive when exposed to moisture with particle contribution from corrosion.
Hydrogen Chlorine (HCL)	Highly corrosive when exposed to moisture, resultant corrosion creates a contamination problem. Care should be taken not to exhaust the cylinder because the moisture concentration will rise and make the problem worse. In addition, typical applications require high flow rates that may cause temperature or pressure fluctuation.
Hydrogen Fluoride (HF)	Very low vapor pressure complicates pressure and flow control. This gas is highly corrosive when exposed to moisture; resulting corrosion creates particle contaminants.
Silane (SiH <sub>4</sub> )	Interaction with small amounts of O <sub>2</sub> or moisture can create particulates.
Tungsten hexafluoride (WF <sub>6</sub> )	Very low vapor pressure in the supply cylinder causes difficulty controlling pressure and flow. Contamination in the presence of moisture clogs delivery lines, bypass, sensor tube and other components. With moisture, it forms HF and solids.
TCA (CH <sub>3</sub> CCL <sub>3</sub> )	Requires nitrogen or argon carrier gas. Control of carrier gas flow rate and avoidance of contamination is crucial to prevent clogging of the bypass, sensor, tube and other components.

TEOS (CH <sub>3</sub> Cl <sub>3</sub> )	This chemical requires a helium or argon carrier gas for transport to the process. Careful pressure/flow control of the carrier gas and a positive temperature gradient to the MFC are required to prevent condensation's clogging the MFC.
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