



SEMI E49.8-1103

GUIDE FOR HIGH PURITY AND ULTRAHIGH PURITY GAS DISTRIBUTION SYSTEMS IN SEMICONDUCTOR MANUFACTURING EQUIPMENT

This guide was technically approved by the Global Gases Committee and is the direct responsibility of the North American Gases Committee. Current edition approved by the North American Regional Standards Committee on September 3, 2003. Initially available at www.semi.org October 2003; to be published November 2003. Originally published in 1996; previously published February 1998.

NOTICE: This document was completely rewritten in 2003.

1 Purpose

1.1 This document specifies guidelines for high purity (HP) and ultrahigh purity (UHP) gas distribution systems in semiconductor manufacturing equipment.

2 Scope

2.1 This guide applies to gas distribution systems consisting of stainless steel components designed to supply the following types of gases to the process chamber:

2.1.1 *Specialty Gases* — Corrosive, flammable, pyrophoric, oxidizer, toxic, inert, and mixtures.

2.1.2 *Bulk Gases* — Nitrogen, oxygen, argon, hydrogen, and helium.

2.2 Typical processes include diffusion, anneal, plasma etch, chemical vapor deposition, physical vapor deposition, and ash.

NOTICE: This standard does not purport to address safety issues, if any, associated with its use. It is the responsibility of the users of this standard to establish appropriate safety health practices and determine the applicability or regulatory limitations prior to use.

3 Referenced Standards

3.1 SEMI Standards

SEMI E49 — Guide for Standard Performance, Practices, and Sub-Assembly for High Purity Piping Systems and Final Assembly for Semiconductor Manufacturing Equipment

SEMI E49.6 — Guide for Subsystem Assembly and Testing Procedures - Stainless Steel Systems

SEMI F1 — Specification for Leak Integrity of High-Purity Gas Piping Systems and Components

SEMI F17 — Specification for High Purity Quality Electropolished 316L Stainless Steel Tubing, Component Tube Stubs, and Fittings Made from Tubing

SEMI F19 — Specification for the Finish of the Wetted Surfaces of Electropolished 316L Stainless Steel Components

SEMI F20 — Specification for 316L Stainless Steel Bar, Extruded Shapes, Plate, and Investment Castings for Components Used in High Purity Semiconductor Manufacturing Applications

SEMI F37 — Method for Determination of Surface Roughness Parameters for Gas Distribution Components

SEMI F58 — Test Method for Determination of Moisture Dry-Down Characteristics of Surface-Mounted and Conventional Gas Distribution Systems by Atmospheric Pressure Ionization Mass Spectroscopy (APIMS)

SEMI F60 — Test Method for ESCA Evaluation of Surface Composition of Wetted Surfaces of Passivated 316L Stainless Steel Components

SEMI F70 — Test Method for Determination of Particle Contribution of Gas Delivery System

SEMI F73 — Test Method for Scanning Electron Microscopy (SEM) Evaluation of Wetted Surface Condition of Stainless Steel Components

SEMI F78 — Practice for Gas Tungsten Arc (GTA) Welding of Fluid Distribution Systems in Semiconductor Manufacturing Applications

SEMI F81 — Specification for Visual Inspection and Acceptance of Gas Tungsten Arc (GTA) Welds in Fluid Distribution Systems in Semiconductor Manufacturing Applications

SEMI S2 — Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment

3.2 ASTM Document¹

¹ American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428-2959, USA. Telephone: 610.832.9585, Fax: 610.832.9555, Website: www.astm.org



ASTM F 1397 — Test Method for Determination of Moisture Contribution for Gas Distribution System Components

NOTICE: Unless otherwise indicated, all documents cited shall be the latest published versions.

4 Terminology

4.1 See Section 4 in SEMI E49.

5 Design Guidelines

5.1 All weld joints should be automatically orbital butt-welded in accordance with SEMI F78 and SEMI F81.

5.2 Directional changes in the process flow path should be minimized. Required directional changes should be accomplished by butt-weld elbows or block components. Tube bends may be used on tubing $\leq \frac{1}{2}$ inch O.D. and should be formed using manual or CNC bending equipment. CNC tube bending is preferred to manual tube bending because during manual bending uniform deformation of the tubing is more difficult to control and reproducibility of bend geometries is much less than that achieved by bending using CNC methods. An internal mandrel must not be used during bending as it can contaminate and/or damage the internal surface. Recommended minimum bend radii are the following:

- For inert gas lines, a bend radius (as measured from the tube centerline) as small as $2 \times$ tube diameter may be used for 90 degree directional changes.
- For reactive gas lines, a bend radius (as measured from the tube centerline) as small as $5x$ tube diameter may be used for 90 degree directional changes; however, it is recommended that corrosion testing be performed to determine if bent tubing is suitable in each particular reactive gas application.

5.3 Components that may need to be removed or replaced should be installed with metal seal fittings.

5.4 Dead volumes should be minimized in the process gas stream. The system internal volume should be minimized.

5.5 All potentially pyrophoric or reactive gases should have upstream and downstream purge/vacuum capability for MFC maintenance. To speed the purge process and allow the system to be evacuated even if the MFC is clogged, the design should also have the ability to provide vacuum both upstream and downstream of the MFC. A gas is defined to be reactive

if it has a Hazardous Production Material (HPM) rating of 3 or 4 per SEMI S2.

5.6 Inert gases do not need an input for an independent purge gas. Inert gases can act as their own purge gas and only need to purge in the intended direction of flow. Inert gas lines do not need upstream vacuum capability or downstream purge capability. To speed the purge process, the design should have the ability to provide vacuum downstream of the MFC.

5.7 For low pressure equipment, the vacuum path from the MFC manifold to the pump should bypass the process chamber during purging or maintenance and should connect directly to the foreline.

5.8 For atmospheric pressure equipment, a vacuum Venturi to vent/exhaust method should be required for reactive gases.

5.9 Design should include a means of cycle purging upstream and downstream of removable components or subassemblies for reactive gases and should include a means of flow-through purging for all removable components.

5.10 Backflow/back pressure protection should be included for all purge gases in the system.

5.11 All incoming gas lines should have filters.

5.12 Any additional filters, located at point of use before a process chamber or loadlock, should have a means of isolation from atmosphere.

5.13 Test/sample ports should be located on each process chamber supply line or the designated purge/vent line.

5.14 For processes requiring additional purification of process gases, purifiers should be included in the gas system and located upstream of MFC's. The system should include a means of purging and removing purifiers in a safe manner.

6 Materials Guidelines

6.1 Stainless Steel

6.1.1 Components should be fabricated from electropolished 316L stainless steel per SEMI F17, or SEMI F20.

6.2 Other Materials

6.2.1 Materials for valve seals, diaphragms, gaskets, and O-rings should be chemically compatible with the process gas. All materials exposed to process gas should be reported.

Table 1 Summary of Requirements for High Purity and Ultrahigh Purity Components and SubAssemblies

Description	High Purity Value	Ultrahigh Purity Value	Units
Internal Surface Chemistry (ESCA) — Test method per SEMI F60 Total chromium to iron ratio including both reduced and oxidized states	refer to SEMI F19	refer to SEMI F19	value
Internal Surface Defects (SEM) — Test procedures per SEMI F73 Photos per test method Counts per photo	refer to SEMI F19	refer to SEMI F19	value value
Internal Surface Roughness — Test procedure per SEMI F37 Average surface roughness (Ra) Maximum surface roughness from an individual measurement	refer to SEMI F19	refer to SEMI F19	µm (µin.) µm (µin.)
Static Flow Particulate Contribution (valves, regulators, flow controllers) — Test procedures per SEMI F70 Particles $\geq 0.1 \mu\text{m}$ Particles $\geq 0.02 \mu\text{m}$	$\leq 0.71 (\leq 20)$ $\leq 2.6 (\leq 75)$	$\leq 0.18 (\leq 5)$ $\leq 0.71 (\leq 20)$	ptc/L (ptc/ft ³) ptc/L (ptc/ft ³)
Internal Absorbed Moisture — Test procedures per ASTM F 1397 or SEMI F58 For low surface area component (valve, regulator), time to recover to baseline from a 2 ppm spike (ASTM F 1397) or 200 ppb spike (SEMI F58) For high surface area component (filters, tubing), time to recover to baseline from a 2 ppm spike (ASTM F 1397) or 200 ppb spike (SEMI F58)	≤ 4 ≤ 6	≤ 1 ≤ 4	hour hour
Cycle Life (valves, regulators, and MFC's) — sample at least 4 and no more than 10 components using a 90% confidence interval and exponential hazard function: Manual valves – MTTF of ≥ 25 K cycles Pneumatic valves, regulators, and MFC's – MTTF of ≥ 500 K cycles	Following cycling, components must meet the particulate contribution requirements in this table and the leak rate requirements in Sections 6.2, 7.2 and 7.3.		

7 Component Guidelines

7.1 Components in subassemblies should comply with the surface requirements listed in SEMI F19, and with additional requirements listed in Table 1.

7.2 All components should meet the inboard/outboard leak rate requirements of SEMI F1.

7.3 Valves should be springless, packless diaphragm type with all metal bonnet seals. All valves should meet the leak across the seat requirements of SEMI F1.

7.4 Valve flow coefficients (C_v) should be selected based on gas flow requirements and gas characteristics. The C_v should be determined using SEMI F32.

7.5 Regulators should be sized based on gas flow requirements and gas characteristics by examination of a droop curve that shows regulator pressure drop as a function of flow at the specific inlet pressure and set outlet pressure conditions.

7.6 Filters in the final line just upstream of the chamber that are intended to protect the chamber from upstream particulate contamination should be 9-LOG retention

for particles greater than or equal to $0.003 \mu\text{m}$ and should be tested per SEMI F38. The filters should be made of PTFE, stainless steel, nickel or ceramic media.

7.7 Pressure transducers should minimize the dead space below the diaphragm.

8 Subsystem Assembly Guidelines

8.1 See SEMI E49.6 for recommended stainless steel system assembly procedures.



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SEMI E51-0200

GUIDE FOR TYPICAL FACILITIES SERVICES AND TERMINATION MATRIX

This guide was technically approved by the Global Facilities Committee and is the direct responsibility of the North American Facilities Committee. Current edition approved by the North American Regional Standards Committee on December 15, 1999. Initially available at www.semi.org January 2000; to be published February 2000. Originally published in 1995; previously published February 1998.

1 Purpose

1.1 The objectives of this guide are to ensure a timely and cost-effective tool installation with minimum impact on the existing customer facilities, systems, and services, and to insure that the quality of facilities supplied (e.g., water, gases, chemicals, electricity) is not compromised once internal to the tool.

1.2 This guide provides the equipment supplier with an understanding of the facilities available at the point of connection (POC) at the "typical" customer site. If these typical facility services are considered by tool manufacturers during their tool design, additional cost and lead times associated with customizing each tool installation can be minimized resulting in reduced costs to build and install semiconductor equipment.

2 Scope

2.1 This document does not include site-specific conditions. The Typical Facilities Services and Termination Matrix Example—United States (see Table 1) identifies utilities, performance, and connections at typical semiconductor facilities. When site specifications differ, the user should create a Site-Specific Facilities Services and Termination Matrix (see Table 2) that is submitted with the request for a quote. Each tool should be supplied in a "facility ready" state. This document represents the range of conditions in which equipment should be capable of operating.

2.2 This guide does not purport to address safety issues, if any, associated with its use. It is the responsibility of the users of this guide to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

3 Impact

3.1 A reference to this guide and the Typical Facilities Services and Termination Matrix (see Table 1) or a completed Site-Specific Facilities Services and Termination Matrix (see Table 2) should be included with other applicable tool purchase specifications. When the supplier receives these documents, a dialogue can be established to resolve any installation issues prior to customer purchase or tool installation. Any

additional facility requirements not identified should be determined when the tool quote is reviewed.

4 Referenced Standards

4.1 SEMI Standards

SEMI E6 — Facilities Interface Specifications Guideline and Format

SEMI E7 — Specification for Electrical Interfaces for the U.S. Only

SEMI E30 — Generic Model for Communications and Control of Manufacturing Equipment (GEM)

SEMI E33 — Specification for Semiconductor Manufacturing Facility Electromagnetic Compatibility

SEMI E49 — Guide for Standard Performance, Practices, and Sub-Assembly for High Purity Piping Systems and Final Assembly for Semiconductor Manufacturing Equipment

SEMI F47 — Specification for Semiconductor Processing Equipment Voltage Sag Immunity

4.2 ANSI Standard¹

ANSI B16.5 — Steel Pipe Flanges, Flanged Valves and Fittings, as it refers to 150 lb. flanges

4.3 IEEE Standards²

IEEE 1100 — Recommended Practice for Powering and Grounding Sensitive Electronic Equipment (IEEE Emerald Book)

4.4 NFPA Document³

NFPA 70 — National Electrical Code

5 Terminology

5.1 Acronyms and Abbreviations

5.1.1 *amb* — ambient temperature conditions

¹ American National Standards Institute (ANSI), 11 W. 42nd Street, New York, NY 10036

² Institute of Electrical and Electronic Engineers (IEEE), 445 Hoes Lane, P.O. Box 1331, Piscataway, NJ 08855-1331

³ National Fire Protection Association (NFPA), 1 Batterymarch Park, P.O. Box 9101, Quincy, MA 02269-9101

- 5.1.2 *atm* — atmospheric conditions, 14.7 psi at sea level
- 5.1.3 *CPVC* — chlorinated polyvinyl chloride
- 5.1.4 *Cu* — copper
- 5.1.5 *EP* — electropolished
- 5.1.6 *Galv.* — galvanized
- 5.1.7 *Hg* — mercury
- 5.1.8 *kPa* — kiloPascals
- 5.1.9 μ — micron
- 5.1.10 *NFPA* — National Fire Protection Association
- 5.1.11 *NPT* — National Pipe Thread (U.S. Standard)
 - 5.1.11.1 *FNPT* — Female National Pipe Thread
 - 5.1.11.2 *MNPT* — Male National Pipe Thread
- 5.1.12 *NW Flange* — ISO NW flange
- 5.1.13 *P. Flange* — ANSI B16.5 pipe flange (for the purpose of this guide)
- 5.1.14 *PFA* — Perfluoralkoy, resin
- 5.1.15 *POC* — point of connection (POC is the point where the facility utility connects to the exterior of the tool.)
- 5.1.16 *POU* — point of use
- 5.1.17 *PP* — Polypropylene
- 5.1.18 *psia* — pounds per square inch, absolute
- 5.1.19 *psig* — pounds per square inch, gauge
- 5.1.20 *PVC* — Polyvinyl Chloride
- 5.1.21 *PVDF* — Polyvinylidene Fluoride
- 5.1.22 *RES.* — resistivity
- 5.1.23 *S.M. Flange* — sheet metal flange
- 5.1.24 *SS* — stainless steel
- 5.1.25 *Stub* — pipe or tube stub

6 Typical Facilities Services and Termination Matrix

6.1 This section of the guide identifies utilities, performance and connections at typical semiconductor facilities. This includes a Typical Facilities Services and Termination Matrix Example—United States (see Table 1). The guide identifies typical utilities and is not intended to be limited to the listed utilities. A Site-Specific Facilities Services and Termination Matrix (see Table 2) is also provided to document differences from Table 1 utilities.

6.2 The following is an explanation of the table headings in the Typical Facilities Services and Termination Matrix.

6.2.1 *Utilities* — This is a list of process or process-related services typically found in semiconductor facilities. The list is divided into water service, gas service, drains, bulk chemical distribution, exhaust and electrical services.

6.2.2 *Supply Temperature* — Temperature and ranges are measured in °C (°F). Equipment or tool cooling systems should be sized to accommodate these ranges.

6.2.3 *Supply/Return Pressure* — Pressure and ranges are measured in kPa (psig). Where possible, equipment should be designed to operate at lower pressure which reduces energy and safety risks. Regulators should be specified by the customer and provided with the tool by the supplier.

6.2.4 *Filtration* — Filtration provides an indicator of particle size expectation at POC to the tool. The fabrication and quality of point of use (POU) filtration should be specified by the customer and provided with the tool by the supplier.

6.2.5 *Specification* — The specification column is a condensed version of typical customer specifications. The column should be used by customers to specify service quality at POC to the tool. Specified quality should not be compromised or lessened in any way internally by the supplier's tool. When the tool purchase specification is prepared, expanded, and detailed, quality requirements should be documented.

6.2.6 *POC Material* — Material that the facility typically uses for connections to tools. Additional material quality characteristics should be identified in the tool purchase specification. Interior piping or tubing should be specified by the customer and provided with the tool by the supplier to meet or exceed the facility POC material quality. (See SEMI E49.)

6.2.7 *POC Fitting* — Compatible connectors are critical to ensure that a tool is “facility ready” once it arrives at a customer site. It is recommended that equipment be supplied with matching connections as requested by customer.

6.2.8 *Notes* — Special conditions or exceptions.

7 General Considerations

7.1 In addition to typical utilities, other facility-related issues should be addressed prior to tool installation.

7.1.1 *Point of Connection Locations* — Due to age of construction or design, all semiconductor facilities are not the same. To interface with equipment or tool, three suggested POC locations have been determined.

(See Figure 1). The POC locations are the top, the bottom, or the back of the tool. The customer should identify a POC location in the tool purchase specification. Suppliers should design tools to allow for internal routing to all locations, to avoid customization for every installation.

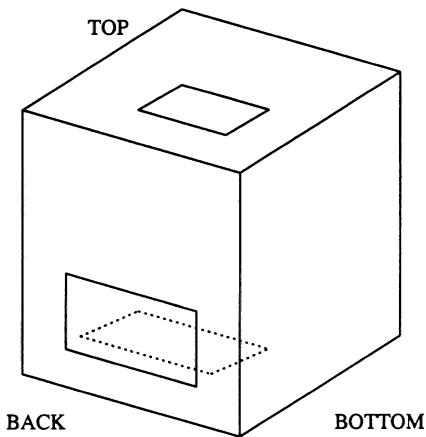


Figure 1
Three Point of Connection Locations

7.1.2 Seismic — The customer should specify the applicable earthquake zone for the installation site. The supplier should provide appropriate seismic restraints and installation instructions.

7.1.3 Vibration — The customer should specify that the supplier should provide the vibration sensitivity of the tool prior to purchase. (See SEMI E6.)

7.1.4 Control and Signal Circuits — The customer should specify and the supplier should provide control and signal circuits that when routed external to the tool are compliant with Article 725, Class 1, Class 2, and Class 3, Remote Control, Signaling and Power Limited — Control Circuits of the National Electrical Code. (See NFPA 70.)

Class 1 — No power limitation, 600 volts max.

Class 2 — Derived from listed Class 2 power supply.

Class 3 — Derived from listed Class 3 power supply.

7.1.5 Installation Requirements Provided by Suppliers
— See SEMI E6.

7.1.6 High Purity Distribution Systems Recommendations — See SEMI E49.

7.1.7 POC Labeling — To ensure accurate connection of facility utilities to each tool POC, the customer should specify and the supplier should provide labeling for each POC. Service labeling should match descriptions listed in the supplier provided installation documentation. (See SEMI E6.)

7.1.7.1 If required, mechanical POC labels should include:

- Service purpose,
- Maximum pressure or pressure range, and
- Flow rate (if appropriate).

POC Label Example: Process Purge, Nitrogen, 80 psig Max.

7.1.7.2 If required, electrical power POC labels should include:

- Service purpose,
- Voltage & phase, and
- Current (Full load ampere continuous).

POC Label Example: Cryo Pump No. 2, 208 V, 1-phase, 28.2 FLA

7.1.7.3 If required, control and signaling POC labels should include:

- Purpose, and
- Class of control (see Section 7.1.4).

POC Label Example: Cryo Pump No. 2 Control, Class 2



Table 1 Typical Facilities Services and Termination Matrix Example — United States

Water Service	Supply Temp.	Supply Pressure (Return Pressure where noted)	Filtration (absolute)	Specification	POC Material	POC Fitting	Notes
Non-Potable Water	4°C - amb (40°F - amb)	S = 258–552 kPa (40–80 psig)	N/A	non-human consumption	Cu/ PVC SCH 40/ PVC SCH 80	NPT	
Ultra Pure Water	20–24°C (68–76°F)	S = 310–379 kPa (45–55 psig)	< 0.1 μ	18+ M ohms RES	PVDF/PFA	stub/p. flange ≥ 5 cm (2 in.) stub/union < 5 cm (2 in.)	
Deionized Water	20–24°C (68–76°F)	S = 310–379 kPa (45–55 psig)	0.1–0.2 μ	17.5 M ohms RES	PVC SCH80/ PVDF/PFA	stub/p. flange ≥ 5 cm (2 in.) stub/union < 5 cm (2 in.)	
Hot Ultra Pure Water	60–90°C (140–194°F)	S = 310–379 kPa (45–55 psig)	< 0.1 μ	site-specific	PVDF	stub/p. flange ≥ 5 cm (2 in.) stub/union < 5 cm (2 in.)	
Fire Protection	amb	NFPA 13	N/A	NFPA 13	N/A	Carbon Steel/SS	
Process Cooling Water	10–16°C (50–60°F)	S = 310–552 kPa (45–80 psig) R = 0–207 kPa (0–30 psig)	1.0–40 μ	50 K ohms RES	PVC SCH80/ Cu/SS	NPT	

Gas Service	Supply Temp.	Supply Pressure	Filtration (absolute)	Specification	POC Material	POC Fitting	Notes
Nitrogen, Ultra Pure	amb	586–655 kPa (85–95 psig)	0.01–0.1 μ	-	316L EP SS	face seal	
Nitrogen, Process	amb	552–621 kPa (80–90 psig)	0.01–0.1 μ	-	316L EP SS	face seal	
Nitrogen, Non-Process	amb	552–655 kPa (80–95 psig)	0.01–0.1 μ	-	Cu/SS	face seal	
Compressed Air	amb	655–758 kPa (95–110 psig)	0.1–5.0 μ	–73 to –40°C (-100 to -40°F) dew point	Cu/SS	compression	
Oxygen	amb	552–586 kPa (80–85 psig)	0.01–0.1 μ	-	316L EP SS	face seal	
Hydrogen, Bulk	amb	414–552 kPa (60–80 psig)	0.01–0.1 μ	-	316L EP SS	face seal	See NOTE 2.
Argon	amb	448–586 kPa (65–85 psig)	0.01–0.1 μ	-	316L EP SS	face seal	
Helium	amb	448–586 kPa (65–85 psig)	0.01–0.1 μ	-	316L EP SS	face seal	



<i>Gas Service</i>	<i>Supply Temp.</i>	<i>Supply Pressure</i>	<i>Filtration (absolute)</i>	<i>Specification</i>	<i>POC Material</i>	<i>POC Fitting</i>	<i>Notes</i>
Natural Gas	-	7–21 kPa (1–3 psig)	-	-	-	NPT	
Process Vacuum	-	53–58 cm Hg (21–23 in. Hg)	-	-	SS/Brass/ PVC SCH 80	NPT	
Specialty Gases	-	site-specific	0.01–0.1 μ	site-specific	site-specific	face seal	See NOTE 3.

<i>Drains</i>	<i>Waste Temp.</i>	<i>Pressure</i>	<i>Filtration (absolute)</i>	<i>Specification</i>	<i>POC Material</i>	<i>POC Fitting</i>	<i>Notes</i>
Acid Waste	< 43°C (110°F) See NOTE 1.	atm	-	-	CPVC SCH80/ PVC SCH 80	stub	See NOTE 4.
H ₂ SO ₄	See NOTE 1.	atm	-	-	PVDF/PVC SCH 80/CPVC SCH 80/ PP	flare type compression	See NOTE 4.
Solvent Waste	See NOTE 1.	atm	-	* Review Chemistry Flash Point	Carbon Steel / 304 SS	NPT or p. flange	See NOTE 4.
Industrial	< 43°C (110°F) See NOTE 1.	atm	-	-	PVC SCH 40/ PVC SCH 80	stub	
DI Reclaim	Varies See NOTE 1.	atm	-	-	PVC SCH 40/ PVC SCH 80/ PVDF	stub	
Fluoride Waste	See NOTE 1.	atm	-	-	PP/PVC SCH 80/PVDF	stub	See NOTE 4.
HF Reclaim	See NOTE 1.	-	-	No water dilution	PVDF/PFA	stub	See NOTE 4.
Slurry	See NOTE 1.	-	-	-	PVC SCH 40 CLEAR/ PVC SCH 40/ PVC SCH 80/ PP	stub	

<i>Bulk Chemical Distribution</i>	<i>Supply Temp.</i>	<i>Supply Pressure (Return Pressure where noted)</i>	<i>Filtration (absolute)</i>	<i>Specification</i>	<i>POC Material</i>	<i>POC Fitting</i>	<i>Notes</i>
Acids, Bases, Oxidizers	amb	-	0.1 μ	PFA Filtration	PVC SCH 40 Clear/PP for secondary, PFA for primary	5 cm (2 in.) FNPT for secondary, flare type compression for primary	Capability of secondary containment to tool interior
Solvents	amb	-	0.1 μ	-	316 SS	face seal/ compression	See NOTE 4.



<i>Exhaust</i>	<i>Temp.</i>	<i>Supply</i>	<i>Filtration (absolute)</i>	<i>Specification</i>	<i>POC Material</i>	<i>POC Fitting</i>	<i>Notes</i>
Heat/General	-	-2.5 to -7.6 cm (-1 to -3 in H ₂ O)	-	-	304 SS/Galv./Acid Res. SS	stub/s.m. flange	within -2.5 to -7.6 cm range (-1 to -3 in H ₂ O) ± 30% variability
Solvent	-	-2.5 to -7.6 cm (-1 to -3 in H ₂ O)	-	-	304 SS/Galv.	stub/s.m. flange	within -2.5 to -7.6 cm range (-1 to -3 in H ₂ O) ± 30% variability
Vacuum Pump	-	-2.5 to -7.6 cm (-1 to -3 in H ₂ O)	-	-	304 SS	NW flange	within -2.5 to -7.6 cm range (-1 to -3 in H ₂ O) ± 30% variability
Acid	-	-2.5 to -7.6 cm (-1 to -3 in H ₂ O)	-	-	Acid Res. SS/PVC SCH 40/PP	stub/p. flange	within -2.5 to -7.6 cm range (-1 to -3 in H ₂ O) ± 30% variability

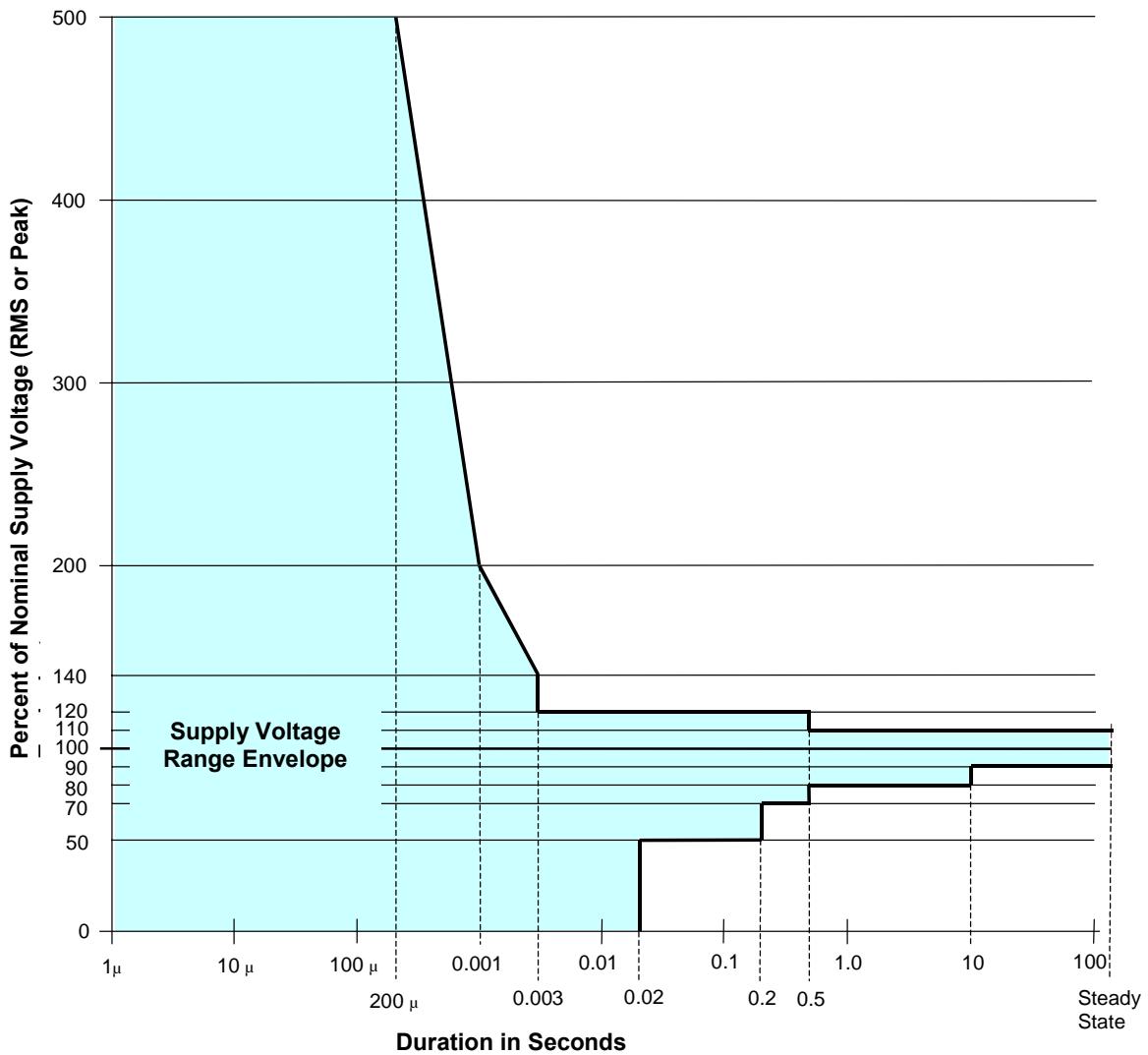
NOTE 1: Review waste composition, concentration, and temperature for material compatibility.

NOTE 2: Tool to have POC mechanical joint secondarily-contained and exhausted.

NOTE 3: Tool to have POC mechanical joint for toxic or hazardous gas POC mechanical joint secondarily-contained and exhausted.

NOTE 4: Tool to have POC mechanical joint secondarily-contained.

<i>Electrical Services</i>	
Applicable Code	See NFPA 70 (National Electrical Code).
Supply Voltage, Nominal	120/208V and 277/480V single-phase, 208/120V and 480/277V three-phase
Typical Supply Voltage Range	See Figure 2.
EMI Noise	See SEMI E33.
ESD Ambient	See SEMI E33.
Ground Currents	See IEEE 1100.
Computer Interfaces	See SEMI E30.
Electrical Interface	See SEMI E7.
UPS	Electrical standards as described by customer



NOTE 1: For Equipment Voltage Sag Immunity Specification see SEMI F47.

Figure 2
Typical Facilities Supply Voltage Range Envelope



Table 2 Site-Specific Facilities Services and Termination Matrix

Water Service	Supply Temp.	Supply Pressure (Return Pressure where noted)	Filtration (absolute)	Specification	POC Material	POC Fitting	Notes
Non-Potable Water							
Ultra Pure Water							
Deionized Water							
Hot Ultra Pure Water							
Fire Protection							
Process Cooling Water							

Gas Service	Supply Temp.	Supply Pressure	Filtration (absolute)	Specification	POC Material	POC Fitting	Notes
Nitrogen, Ultra Pure							
Nitrogen, Process							
Nitrogen, Non-Process							
Compressed Air							
Oxygen							
Hydrogen, Bulk							
Argon							
Helium							
Natural Gas							
Process Vacuum							
Specialty Gases							

Drains	Waste Temp.	Pressure	Filtration (absolute)	Specification	POC Material	POC Fitting	Notes
Acid Waste							
H ₂ SO ₄							
Solvent Waste							
Industrial							
DI Reclaim							
Fluoride Waste							
HF Reclaim							
Slurry							

Bulk Chemical Distribution	Supply Temp.	Supply Pressure (Return Pressure where noted)	Filtration (absolute)	Specification	POC Material	POC Fitting	Notes
Acids, Bases, Oxidizers							
Solvents							



Exhaust	Temp.	Supply	Filtration (absolute)	Specification	POC Material	POC Fitting	Notes
Heat/General							
Solvent							
Vacuum Pump							
Acid							

<i>Electrical Services</i>	
Applicable Code	
Supply Voltage, Nominal	
Supply Voltage Range	
EMI Noise	
ESD Ambient	
Ground Currents	
Computer Interfaces	
Electrical Interface	
UPS	

<i>Site-Specific Notes:</i>	
Freight Elevator:	
Height/Width/Depth	
Load Rating	
Bldg./Fab Restrictions:	
Cleanroom Parameters	
Noise Level	
Ceiling Heights	
Max. Clearances in Support Areas	
Other:	

8 Related Documents

8.1 SEMI Standards

SEMI E4 — SEMI Equipment Communications Standard 1 Message Transfer (SECS-I)

SEMI E5 — SEMI Equipment Communications Standard 2 Message Content (SECS-II)

SEMI E37 — High-Speed SECS Message Services (HSMS) Generic Services

SEMI E37.1 — High-Speed SECS Message Services Single-Session Mode (HSMS-SS)

SEMI E37.2 — High-Speed SECS Message Services General Session (HSMS-GS)

SEMI E76 — Guide for 300 mm Process Equipment Points of Connection to Facility Services

SEMI S2 — Environmental, Health, and Safety Guideline for Semiconductor Manufacturing Equipment

SEMI S6 — Safety Guideline for Ventilation



NOTICE: SEMI makes no warranties or representations as to the suitability of the guides set forth herein for any particular application. The determination of the suitability of the guide is solely the responsibility of the user. Users are cautioned to refer to manufacturer's instructions, product labels, product data sheets, and other relevant literature respecting any materials mentioned herein. These guides are subject to change without notice.

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SEMI E52-0703

PRACTICE FOR REFERENCING GASES AND GAS MIXTURES USED IN DIGITAL MASS FLOW CONTROLLERS

This practice was technically approved by the Global Gases Committee and is the direct responsibility of the North American Gases Committee. Current edition approved by the North American Regional Standard Committee on April 11, 2003. Initially available at www.semi.org May 2003; to be published July 2003. Originally published in 1995; previously published March 2002.

NOTICE: This document was completely rewritten in 2003.

1 Purpose

1.1 To provide a numerical index of gases and gas mixtures used in the semiconductor industry that will give an ordered reference for the gases and gas mixtures when used in mass flow devices. This index or list will facilitate the production and use of digital mass flow devices.

2 Scope

2.1 The list includes gases, gas mixtures, and vaporizable materials that can be used in mass flow devices. The list will supplement, not replace, existing DOT/OSHA or other identification systems. For ease of use, the list is presented sorted by gas code, gas name, and symbol for gases and vaporizable materials and by code and mixture percentage for gas mixtures.

NOTICE: This standard does not purport to address safety issues, if any, associated with its use. It is the responsibility of the users of this standard to establish appropriate safety health practices and determine the applicability of regulatory or other limitations prior to use.

3 Limitations

3.1 This list does not provide information related to the safe use and intended application of listed materials.

4 Referenced Standards

4.1 NIST Standard¹

NIST AD732-043 — JANAF Thermochemical Tables, 2nd Edition

4.2 Miscellaneous Publications

Dangerous Properties of Industrial Materials, 5th Edition, N. Irving Sax, © 1979²

¹ National Institute of Standards and Technology, 100 Bureau Drive, Stop 3460, Gaithersburg, MD 20899-3460, USA. Telephone: 301.975.6478. Website: www.nist.gov

² CRC Press LLC, (Headquarters) 2000 Corporate Blvd., NW, Boca Raton, FL 33431, 561.994.0555

Encyclopedia of Gas, Air Liquide, © 1976³

Matheson Gas Data Book, 6th Edition, © 1980⁴

The Merck Manual Index, 6th Edition⁵

4.3 Data Sheets

Air Products & Chemicals Data Sheet, © 1991⁶

American Cyanamid Data Sheet⁷

Callery Chemical Borazine Data Sheet, © 1984⁸

DuPont Data Sheet⁹

Schumacher Material Safety Data Sheet, No. R&D 49.3 JN, Revision Date 1/95¹⁰

Schumacher Product Data Sheet, No. 23, Revision 3

4.4 Handbooks

Chemical Engineers' Handbook, 5th Edition¹¹

CRC Handbook of Chemistry and Physics, 75th Edition, © 1994¹²

4.5 Other Standard

Nomenclature of Organic Chemistry, authored by International Union of Pure and Applied Chemistry (IUPAC), edited by J. Rigauby, © 1979¹³

³ Litton Publishing

⁴ Matheson Gas Products, Inc., 959 Route 46 East, P.O. Box 624, Parsippany, NJ 07054, 973.257.1100

⁵ This publication is available from Franklin Electronic Publishers, 1 Franklin Plaza, Burlington, NJ 08060, 1.800.266.5626

⁶ Air Products & Chemicals Inc.-PA, Rural Route 1, Tamaqua, PA 18252, 717.467.2981

⁷ American Cyanamid Company, CALI Corporation Center, 50 Tice Blvd., Woodcliff Lake, NJ 07675, 201.930.0455

⁸ Callery Chemical Company, P.O. Box 429, Pittsburgh, PA 15230, 412.967.4100

⁹ E.I. du Pont de Nemours and Company, 1007 Market St., Wilmington, DE 19898, 302.774.1000

¹⁰ Schumacher, 1969 Palomar Oaks Way, Carlsbad, CA 92009-1307, 619.931.9555

¹¹ McGraw-Hill Inc., Princeton Rd., Hightstown, NJ 08520, 609.426.5934

¹² CRC Press LLC Headquarters, 2000 NW Corporate Blvd., Boca Raton, FL 33431, USA, Phone: 1(800)272-7737 or (561)994-0555 Fax: 1(800)374-3401 or (561)989-9732

¹³ This publication is available from Franklin Book Company, 7804 Montgomery Ave., Elkon's Park, PA 19027, 215.635.5252

NOTICE: Unless otherwise indicated, all documents cited shall be the latest published versions.

5 Terminology

5.1 Definitions

5.1.1 *formula* — the structural representation of a gas, indicating the molecular groupings. Formulas are unique and unambiguous except in the case of isomers.

5.1.2 *gas code* — an integer that is uniquely associated with a particular gas.

5.1.3 *gas name* — the accepted name for a gas as specified in *Nomenclature of Organic Chemistry*.

5.1.4 *symbol* — commonly accepted, unambiguous, and unique identification using ASCII characters with no subscripts, superscripts, or parenthesis.

6 Gas Table Sorted by Code

Table 1 Gases Sorted by Code

Code	Gas Name	Symbol	Formula	Synonym	Ref
1	Helium	He	He		1
2	Neon	Ne	Ne		1
3	Radon	Rn	Rn		2
4	Argon	Ar	Ar		1
5	Krypton	Kr	Kr		1
6	Xenon	Xe	Xe		1
7	Hydrogen	H2	H ₂		1
8	Air	Air			1
9	Carbon Monoxide	CO	CO		1
10	Hydrogen Bromide	HBr	HBr		1
11	Hydrogen Chloride	HCl	HCl		1
12	Hydrogen Fluoride	HF	HF		1
13	Nitrogen	N2	N ₂		1
14	Deuterium	D2	H ₂ ²	D2	2
15	Oxygen	O2	O ₂		1
16	Nitric Oxide	NO	NO		2
17	Hydrogen Iodide	HI	HI		1
18	Fluorine	F2	F ₂		1
19	Chlorine	Cl2	Cl ₂		1
20	Water Vapor	H2O	H ₂ O		2
21	Bromine	Br2	Br ₂		2
22	Hydrogen Sulfide	H2S	H ₂ S		1
23	Hydrogen Selenide	H2Se	H ₂ Se		1
24	Hydrogen Cyanide	HCN	HCN		1
25	Carbon Dioxide	CO2	CO ₂		1
26	Nitrogen Dioxide	NO2	NO ₂		1
27	Nitrous Oxide	N2O	N ₂ O		1
28	Methane	CH4	CH ₄		1
29	Ammonia	NH3	NH ₃		1
30	Ozone	O3	O ₃		1
31	Phosphine	PH3	PH ₃		1

Code	Gas Name	Symbol	Formula	Synonym	Ref
32	Sulfur Dioxide	SO2	SO ₂		1
33	Methyl Fluoride	CH3F	CH ₃ F	Fluoromethane or Methane, Fluoro	1
34	Carbonyl Sulfide	COS	COS		1
35	Arsine	AsH3	AsH ₃		1
36	Methyl Chloride	CH3Cl	CH ₃ Cl	Chloromethane or Methane, Chloro	1
37	Cyanogen Chloride	CICN	CICN		1
38	Ethylene	C2H4	CH ₂ =CH ₂	Ethene	1
39	Silane	SiH4	SiH ₄		1
40	Carbon Disulfide	CS2	CS ₂		2
41	Oxygen Difluoride	OF2	OF ₂		1
42	Acetylene	C2H2	HC≡CH	Ethyne	1
43	Germane	GeH4	GeH ₄		1
44	Methyl Bromide	CH3Br	CH ₃ Br	Bromomethane or Methane, Bromo	1
45	Ethylene Oxide	C2H4O	C ₂ H ₄ O	Acetaldehyde	1
46	Carbonyl Fluoride	CF2O	CF ₂ O		1
47	Methyl Mercaptan	CH4S	CH ₃ SH		1
48	Boron Trifluoride	BF3	BF ₃		1
49	Fluoroform	CHF3	CHF ₃	Trifluoromethane or Methane, Trifluoro, F-23, R-23	1
50	Hydrazine	N2H4	H ₂ NNH ₂		2
51	Vinyl Fluoride	C2H3F	H ₂ C=CHF		1
52	Methylamine	CH5N	CH ₃ NH ₂	Amino Methane, Monomethylamine	2
53	Nitrogen Trifluoride	NF3	NF ₃		1
54	Ethane	C2H6	CH ₃ CH ₃		1
55	Vinyl Chloride	C2H3Cl	CH ₂ =CHCl	Chloroethylene	1
56	Vinyl Bromide	C2H3Br	CH ₂ =CHBr		1
57	Chlorodifluoromethane	CHClF2	CClHF ₂	F-22, R-22	1
58	Diborane	B2H6	B ₂ H ₆		1
59	Cyanogen	C2N2	NCCN	Oxalodinitrile	1
60	Phosgene	CCl2O	CCl ₂ O	Carbonyl Chloride	1
61	Cyclopropane	C3H6	C ₃ H ₆		1
62	Phosphorus Trifluoride	PF3	PF ₃		1
63	Carbon Tetrafluoride	CF4	CF ₄	Tetrafluoromethane or Methane, Tetrafluoro	1
64	Difluoroethylene	C2H2F2	CH ₂ =CF ₂	G-1132A, Vinylidenefluoride	1
65	Dichlorofluoromethane	CHCl2F	CHCl ₂ F	F-21, R-21	1
66	Allene	C3H4	CH ₂ =C=CH ₂	Propadiene	1
67	Dichlorosilane	SiH2Cl2	SiH ₂ Cl ₂		1
68	Methyl Acetylene	C3H4	CH ₃ C≡CH	Propyne	1
69	Propylene	C3H6	CH ₃ CH=CH ₂	Propene	1
70	Boron Trichloride	BCl3	BCl ₃		1
71	Chloroform	CHCl3	CHCl ₃	Trichloromethane or Methane, Trichloro	2

Code	Gas Name	Symbol	Formula	Synonym	Ref
72	Perchloryl Fluoride	ClO ₃ F	ClO ₃ F		1
73	Dimethyl Ether	C ₂ H ₆ O	CH ₃ OCH ₃	Methylether	1
74	Chlorotrifluoromethane	CClF ₃	ClCF ₃	F-13, R-13	1
75	Ethyl Chloride	C ₂ H ₅ Cl	C ₂ H ₅ Cl	Chloroethane or Ethane, Chloro or Ethyl Chloride	1
76	Bromine Trifluoride	BrF ₃	BrF ₃		1
77	Chlorine Trifluoride	ClF ₃	ClF ₃		1
78	Nitrogen Trioxide	N ₂ O ₃	N ₂ O ₃		1
79	Boron Tribromide	BBr ₃	BBr ₃		1
80	Bromotrifluoromethane	CBrF ₃	BrCF ₃	F-13B1, R-13B1	1
81	Methyl Vinyl Ether	C ₃ H ₆ O	CH ₃ OCH=CH ₂		1
82	Difluoroethane	C ₂ H ₄ F ₂	CH ₃ CHF ₂	Ethyldene Fluoride, R-152A	1
83	Tribromomethane	CHBr ₃	CHBr ₃		2
84	Dichlorodifluoromethane	CCl ₂ F ₂	CCl ₂ F ₂	F-12, R-12	1
85	Dimethylamine	C ₂ H ₇ N	(CH ₃) ₂ NH		1
86	Sulfur Tetrafluoride	SF ₄	SF ₄		1
87	Sulfuryl Fluoride	SO ₂ F ₂	SO ₂ F ₂		1
88	Silicon Tetrafluoride	SiF ₄	SiF ₄		1
89	Propane	C ₃ H ₈	CH ₃ CH ₂ CH ₃		1
90	Intentionally Left Blank				
91	Trichlorofluoromethane	CCl ₃ F	CCl ₃ F	F-11, R-11	1
92	Intentionally Left Blank				
93	Ethyl Acetylene	C ₄ H ₆	CH ₃ CH ₂ C≡CH		1
94	Tetrafluorethylene	C ₂ F ₄	F ₂ C=CF ₂		1
95	Nitrogen Tetroxide	N ₂ O ₄	N ₂ O ₄	Dinitrogenoxide	2
96	Arsenic Pentafluoride	AsF ₅	AsF ₅		2
97	Disilane	Si ₂ H ₆	Si ₂ H ₆		2
98	Transbutene	C ₄ H ₈	CH ₃ CH=CHCH ₃		2
99	Germanium Tetrafluoride	GeF ₄	GeF ₄	Tetrafluorogermande	2
100	Butadiene	C ₄ H ₆	CH ₂ =C=CHCH ₃	Methylallene	1
101	Carbon Tetrachloride	CCl ₄	CCl ₄	Tetrachloromethane or Methane, Tetrachloro	2
102	Phosphorous Oxychloride	POCl ₃	POCl ₃		2
103	Difluorochloroethane	C ₂ H ₃ ClF ₂	CF ₂ ClCH ₃	F-142B, R-142B	1
104	Butene	C ₄ H ₈	CH ₃ CH ₂ CH=CH ₂	1-Butene	1
105	Bromotrifluoroethylene	C ₂ BrF ₃	CF ₂ CFBr		1
106	Isobutene	C ₄ H ₈	(CH ₃) ₂ C=CH ₂	Isobutylene,Methylpropene	2
107	Cisbutene	C ₄ H ₈	CH ₃ CH=CHCH ₃	Cis-2-Butene	2
108	Silicon Tetrachloride	SiCl ₄	SiCl ₄	Tetrachlorosilane	2
109	Trimethylamine	C ₃ H ₉ N	(CH ₃) ₃ N	Methylamine	1
110	Sulfur Hexafluoride	SF ₆	SF ₆		1
111	Isobutane	C ₄ H ₁₀	(CH ₃) ₂ CHCH ₃	2-Methylpropane or Propane, 2-Methyl	1
112	Trichloroethane	C ₂ H ₃ Cl ₃	CH ₃ CCl ₃	TCA, Methylchloroform	2
113	Germanium Tetrachloride	GeCl ₄	GeCl ₄	Tetrachlorogermande	2
114	Titanium Tetrachloride	TiCl ₄	TiCl ₄		2

Code	Gas Name	Symbol	Formula	Synonym	Ref
115	Iodine Pentafluoride	IF5	IF ₅		1
116	Bromine Pentafluoride	BrF5	BrF ₅		1
117	Butane	C4H10	CH ₃ (CH ₂) ₂ CH ₃		1
118	Hexafluoroethane	C2F6	F ₃ CCF ₃	F-116, Perfluoroethane	1
119	Chloropentafluoroethane	C2ClF5	ClCF ₂ CF ₃	F-115, R-115	1
120	Methylbutene	C5H10	CH ₃ CH ₂ CCH ₃ =CH ₂	2-Methyl-1-Butene	1
121	Tungsten Hexafluoride	WF6	WF ₆		2
122	Dimethylpropane	C5H12	(CH ₃) ₄ C	Neopentane	2
123	Uranium Hexafluoride	UF6	UF ₆		2
124	Molybdenum Hexafluoride	MoF6	MoF ₆		2
125	Dichlorotetrafluoroethane	C2Cl2F4	F ₃ CCCl ₂ F	F-114, R-114	1
126	Trichlorotrifluoroethane	C2Cl3F3	CF ₂ ClCCl ₂ F	F-113, R-113	1
127	Hexane	C6H14	CH ₃ (CH ₂) ₄ CH ₃		2
128	Perfluoropropane	C3F8	CF ₂ (CF ₃) ₂		1
129	Octafluorocyclobutane	C4F8	(CF ₂) ₄	Perfluorocyclobutane or Cyclobutane, Perfluoro	1
130	Dibromotetrafluoroethane	C2Br2F4	BrF ₂ CCF ₂ Br	F-114B2, R-114B2	1
131	Trimethoxyborine	C3H9BO3	B(OCH ₃) ₃	TMB, Trimethylborate	2
132	Trimethylphosphorous	C3H9P	(CH ₃) ₃ P	Trimethylphosphine, TMP	2
133	Trimethylphosphite	C3H9PO3	(CH ₃ O) ₃ P	TMPi, Trimethoxyphosphine	2
134	Difluorosilane	SiH2F2	SiH ₂ F ₂		10
135	Dimethylzinc	C2H6Zn	(CH ₃) ₂ Zn		3
136	Ethanol	C2H6O	CH ₃ CH ₂ OH		2
137	Halothane	C2HBrClF3	BrClHCCF ₃		6
138	Hexafluoropropylene	C3F6	CF ₃ CF=CF ₂	Perfluoropropylene or Propylene, Perfluoro	1
139	Hexamethyldisilane	C6H18Si2	(CH ₃) ₃ Si ₂ (CH ₃) ₃	HMDSi, HMDS	3
140	Nickel Carbonyl	C4O4Ni	Ni(CO) ₄		1
141	Nitrosyl Chloride	NOCl	NOCl		1
142	Pentaborane	B5H9	B ₅ H ₉		2
143	Phosphorus Pentafluoride	PF5	PF ₅		1
144	Tetraethoxysilane	C8H20O4Si	(C ₂ H ₅ O) ₄ Si	TEOS	2
145	Tin Tetrachloride	SnCl4	SnCl ₄	Tetrachlorostannane	2
146	Tributylaluminum	C12H27Al	(CH ₃ CH ₂ CH ₂ CH ₂) ₃ Al	TBAI	3
147	Trichlorosilane	SiHCl3	SiHCl ₃		5
148	Triethylgallium	C6H15Ga	(C ₂ H ₅) ₃ Ga	TEGa	4
149	Trimethylaluminum	C3H9Al	Al(CH ₃) ₃	TMA, TMAl	4
150	Trimethylantimony	C3H9Sb	(CH ₃) ₃ Sb	Trimethylstibene	2
151	Trimethylarsenic	C3H9As	(CH ₃) ₃ As	Trimethylarsine, TMAs	2
152	Trimethylgallium	C3H9Ga	Ga(CH ₃) ₃	TMGa	4
153	Trimethylindium	C3H9In	(CH ₃) ₃ In	TMIn	3
154	Diethylsilane	C4H12Si	(C ₂ H ₅) ₂ SiH ₂		2
155	Pentafluoroethane	C2HF5	CF ₃ CHF ₂	F-125, R-125	9
156	Tetrafluoroethane	C2H2F4	CH ₂ FCF ₃	R-134A, F-134A	2
157	Tetrafluorohydrazine	N2F4	F ₂ NNF ₂	Dinitrogen Tetrafluoride	1
158	Tetramethylcyclotetra-siloxane	C4H16Si4O4	(CH ₃) ₄ H ₄ (SiO) ₄	TOMCATS	7

Code	Gas Name	Symbol	Formula	Synonym	Ref
159	Tritium	T2	H ₃ ²	T2	2
160	Difluoromethane	CH2F2	CH ₂ F ₂	Methylene Fluoride	2
161	Tertiarybutylarsine	C4H11As	C(CH ₃) ₃ AsH ₂	TBA	8
162	Tertiarybutylphosphine	C4H11P	C(CH ₃) ₃ PH ₂	TBP	8
163	Triethylborate	C6H15O3B	B(OC ₂ H ₅) ₃	TEB, Triethoxyborane	2
164	Dimethylaluminum-hydride	C2H7Al	(CH ₃) ₂ AlH	DMAH	13
165	Trimethylaminealane	C3H12AlN	(CH ₃) ₃ NAIH ₃	TMAA	11
166	Dimethylethylaminealane	C4H14NAI	(CH ₃) ₂ C ₂ H ₅ NAIH ₃	DMEA	14
167	Nitric Acid	HNO3	HNO ₃		2
168	Tetrachloroethylene	C2Cl4	Cl ₂ C=CCl ₂	Perchloroethylene or Ethylene, Perchloro	2
169	Ethyleneglycol	C2H6O2	HOCH ₂ CH ₂ OH	Ehtanediol, Glycol	2
170	Hexanediol-1,6	C6H14O2	HO(CH ₂) ₆ OH	Hexyleneglycol, Hexamethyleneglycol	2
171	Sulfuric Acid	H2SO4	H ₂ SO ₄		2
172	Chlorobenzene	C6H5Cl	C ₆ H ₅ Cl	Chlorobenzol, Phenylchloride	2
173	Acetonitrile	C2H3N	CH ₃ CN		2
174	Ethylbenzene	C8H10	C ₆ H ₅ C ₂ H ₅		2
175	Intentionally Left Blank				
176	Methanol	CH4O	CH ₃ OH	Methyl Alcohol	2
177	Methylcyclohexane	C7H14	CH ₃ C ₆ H ₁₁	Hexahydrotoluene	2
178	4-Methyl, 1-Pentene	C6H12	(CH ₃) ₂ CHCH ₂ CH=CH ₂		2
179	o-Xylene	C8H10	1,2-(CH ₃) ₂ C ₆ H ₄	1,2-Dimethylbenzene	2
180	Phenol	C6H6O	C ₆ H ₅ OH		2
181	Toluene	C7H8	C ₆ H ₅ CH ₃	Methylbenzene	2
182	Tetrahydrofuran	C4H8O	C ₄ H ₈ O		2
183	Methyltrichlorosilane	CH3Cl3Si	CH ₃ SiCl ₃	MTS	2
184	Acetone	C3H6O	CH ₃ COCH ₃		2
185	Methylsilane	CH6Si	CH ₃ SiH ₃	Monomethylsilane	2
186	2,2 Dichloro 1,1,1 Trifluoroethane	C2HCl2F3	CHCl ₂ -CF ₃	Freon 123, Suva 123	2
187	Isopropal Alcohol	C3H8O	(CH ₃) ₂ CHOH	2-Propanol	2
188	Diethoxy Dimethyl Silane	C6H16O2Si	(C ₂ H ₅ O) ₂ Si(CH ₃) ₂		2
189	Sulfur Monochloride	S2Cl2	S ₂ Cl ₂		2
190	Trimethyl Silane	C3H10Si	(CH ₃) ₃ SiH		2
191	Dichloroethylene -trans	C2H2Cl2	CHCl=CHCl		2
192	Hexafluorobenzene	C6F6	C ₆ F ₆		2
193	Phosphorus Trichloride	PCL3	PCl ₃		2
194	Titanium Tetraisopropoxide	C12H28OTi	Ti(OC ₃ H ₇) ₄		1
195	Arsenic Trifluoride	AsF3	AsF ₃		2
196	Arsenic Triiodine	AsI3	AsI ₃		2
197	Benzene	C6H6	C ₆ H ₆		2
198	Borazine	B3N3H6	H ₃ B ₃ N ₃ H ₃		14
199	Bromochlorodifluoromethane	CBrClF2	BrClCF ₂		2
200	Carbon Tetrabromide	CBr4	CBr ₄		2
201	Chlorine Dioxide	ClO2	ClO ₂		2
202	Chlorine Pentafluoride	ClF5	ClF ₅		2

Code	Gas Name	Symbol	Formula	Synonym	Ref
203	Chlorodifluoroethane	C2H3ClF2	CH ₃ -CF ₂ Cl	R-142b	4
204	Chlorodifluoroethylene	C2HClF2	CF ₂ =CHCl	R-1122, FREON-1122	4
205	Chlorosilane	SiH3Cl	SiH ₃ Cl		2
206	Chlorotrifluoroethylene	C2ClF3	FCCl=CF ₂	R-1113, FREON-1113	2
207	Cyclobutane	C4H8	C ₄ H ₈	Tetramethylene	2
208	Diazomethane	CH2N2	CH ₂ N ₂	Acomethylene	2
209	Dibromodifluoromethane	CBr2F2	Br ₂ CF ₂	R-12B2, FREON-12B2	2
210	Dichloroethylene	C2H2Cl2	CH ₂ =CCl ₂	Vinylidene Chloride	2
211	Dichloroethylene -cis	C2H2Cl2	CHCl=CHCl		2
212	Dichlorodimethylsilane	C2H6SiCl2	(CH ₃) ₂ SiCl ₂		2
213	Diethylamine	C4H11N	(C ₂ H ₅) ₂ NH		2
214	Diethylzinc	C4H10Zn	Zn(C ₂ H ₅) ₂		2
216	Arsenic Trichloride	AsCl3	AsCl ₃		2
217	Digermane	Ge2H6	Ge ₂ H ₆		2
218	Dimethylcadmium	C2H6Cd	(CH ₃) ₂ Cd		2
219	Dimethylsilane	C2H8Si	(CH ₃) ₂ SiH ₂		2
220	Dimethyltellurium	C2H6Te	(CH ₃) ₂ Te		2
221	Ethyl Fluoride	C2H5F	CH ₃ CH ₂ F	Fluoroethane, R-161, FREON-161	2
222	Ethylene Dichloride	C2H4Cl2	ClCH ₂ CH ₂ Cl	1,2 Dichloroethane	2
223	Fluoroacetylene	C2HF	FC≡CH		2
224	Fluorotriethoxysilane	C6H15OSiF	(C ₂ H ₅ O) ₃ SiF		2
225	Hexafluoroacetone	C3F6O	(CF ₃) ₂ CO		2
226	Aluminum Trifluoride	AlF3	AlF ₃		2
227	Hexamethyldisilazane	C6H19Si2N	(CH ₃) ₆ Si ₂ NH		2
228	Hexamethyldisiloxane	C6H18Si2O	(CH ₃) ₆ Si ₂ O		2
229	Hydrogen telluride	H2Te	H ₂ Te		2
230	Iron Carbonyl	C5O5Fe	Fe(CO) ₅		2
231	Isopentane	C5H12	CH ₃ CH ₂ CH(CH ₃) ₂	2-Methylbutane	2
232	Difluoroamidogen	NF2	NF ₂		2
233	Monoethylamine	C2H7N	C ₂ H ₅ NH ₂		2
234	Monomethyl hydrazine	CH6N2	CH ₃ N ₂ H ₃		2
235	Nitromethane	CH3NO2	CH ₃ NO ₂		2
236	Octafluorobutane	C4F8	C ₄ F ₈		3
237	Octane	C8H18	CH ₃ (CH ₂) ₆ CH ₃		2
238	Oxygen Dichloride	OCl2	OCl ₂		2
239	Pentaborane(11)	B5H11	B ₅ H ₁₁		2
240	Pentane	C5H12	CH ₃ (CH ₂) ₃ CH ₃		2
241	Perfluorobutane	C4F10	C ₄ F ₁₀		3
242	Arsenic Tribromide	AsBr3	AsBr ₃		2
243	Rhenium Hexafluoride	ReF6	ReF ₆		2
244	Deuteriumsilane	SiD4	SiH ₂ ⁴		2
245	Stibine	SbH3	SbH ₃		2
246	Sulfur Trioxide	SO3	SO ₃		2
247	Tellurium Hexafluoride	TeF6	TeF ₆		2

Code	Gas Name	Symbol	Formula	Synonym	Ref
248	Tetrachlorodiborane	B2Cl4	B ₂ Cl ₄		2
249	Tetrafluorodiborane	B2F4	B ₂ F ₄		2
250	Tetramethylgermanium	C4H12Ge	(CH ₃) ₄ Ge		2
251	Tetramethylsilane	C4H12Si	(CH ₃) ₄ Si		2
252	Tetramethyl Tin	C4H12Sn	(CH ₃) ₄ Sn		2
253	Tetrasilane	Si4H10	Si ₄ H ₁₀		2
254	Titanium Tetraiodide	TiI4	TiI ₄		2
255	Tribromostibine	SbBr3	SbBr ₃		2
256	Trichlorostibine	SbCl3	SbCl ₃		2
257	Triethylaluminum	C6H15Al	(C ₂ H ₅) ₃ Al		2
258	Triethylantimony	C6H15Sb	(C ₂ H ₅) ₃ Sb		2
259	Trifluoroacetic Acid	CF3CO2H	CF ₃ CO ₂ H		2
260	Trifluoroacetonitrile	C2F3N	F ₃ CCN		2
261	Trifluorosilane	SiHF3	SiHF ₃		2
262	Triisobutylaluminum	C12H27Al	(C ₄ H ₉) ₃ Al		2
263	Xylene m-	C8H10	1,3-(CH ₃) ₂ C ₆ H ₄	1,3 Dimethyl Benzene	3
264	Xylene p-	C8H10	1,4-(CH ₃) ₂ C ₆ H ₄	1,4 Dimethyl Benzene	3
265	Dichloromethane	CH2Cl2	CH ₂ Cl ₂		
266	Octafluorocyclopentene	C5F8	CF ₂ =C(CF ₃)-CF=CF ₂		3
267	Hexafluoro Propane	C3H2F6	CH ₂ FCF ₂ CF ₃	1,1,1,2,2,3-Hexafluoropropane	2
268	Methylene Bromide	CH2Br2	CH ₂ Br ₂	UN 2664; Methyl dibromide, Dibromomethane	1
269	Hydrazoic Acid	HN3	HN ₃		1
270	Hexafluoro-2-Butyne	C4F6	CF ₃ C≡CCF ₃	Bis(trifluoromethyl)acetylene; Perfluoro-2-butyne	3
271	Butanol-1	C4H10O	CH ₃ CH ₂ CH ₂ CH ₂ OH		3
272	Hexafluoro Acetylacetone	C5H2F6O2	C ₅ H ₂ F ₆ O ₂		1
273	Tungsten Hexacarbonyl	C6O6W	W(CO) ₆		1
274	TEAsat	C6H15O4As	(C ₂ H ₅ O) ₃ AsO		1
275	Hafnium Tetranitrate	HfN4O12	Hf(NO ₃) ₄		1
276	Acrylonitrile	C3H3N	CH ₂ -CHCN	Acrylon; Propenenitrile	3
277	Trimethylborane	C3H9B	(CH ₃) ₃ B		2
278	Silicon tetrabromide	Br4Si	Br ₄ Si	SiBr ₄ ; Tetrabromosilane; Silicon (IV) bromide	2
279	Tantalum (V) ethoxide	C10H25O5Ta	C ₁₀ H ₂₅ O ₅ Ta	Ta(Oet)5	2
280	Diphenylmethylenediamine	C13H14N2	C ₁₃ H ₁₄ N ₂		2
281	Diphenylmethan-4,4' -diisocyanat	C15H10N2O	C ₆ H ₁₀ N ₂ O	UN 2489; Benzene,1,1' - methylenebis(isocyanatophenyl)	2
282	Tetrakis(diethylamino)titanium	C16H40N4Ti	C ₁₆ H ₄₀ N ₄ Ti		2
283	Acetic acid	C2H4O2	CH ₃ COOH	Ethanoic acid; UN 2789;	2
284	Dimethyl selenide	C2H6Se	C ₂ H ₆ Se	(CH ₃) ₂ Se; Selenium dimethyl; Dimethylselenium	2
285	Ethoxy silane	C2H8OSi	C ₂ H ₈ OSi		2
286	Hexafluoropropylene oxide	C3F6O	C ₃ F ₆ O	Hexafluoroepoxypropane	2
287	Trimethoxy silane	C3H10O3Si	C ₃ H ₁₀ O ₃ Si		2
288	Pentafluoropropanol	C3H3F5O	C ₂ F ₅ CH ₂ OH	Perfluorodihydropropanol, 1,1,1,2,2-Pentafluoropropane	2

Code	Gas Name	Symbol	Formula	Synonym	Ref
289	Acrylic acid	C3H4O2	C ₃ H ₄ O ₂	2-Propenoic acid; CH ₂ =CHCOOH	2
290	Trifluoropropane	C3H5F3	C ₃ H ₅ F ₃	1,1,1-Trifluoropropane; CH ₃ CH ₂ CF ₃	2
291	Ethyl Formate	C3H6O2	HCO ₂ C ₂ H ₅	Ethyl ester formic acid; HC00C ₂ H ₅	3
292	Methyl acetate	C3H6O2	CH ₃ CO ₂ CH ₃	Methyl ester acetic acid; UN 1231	3
293	Propenamine	C3H7N	C ₃ H ₇ N	Allylamine; Monoallylamine; UN 2334	2
294	Trimethyl ester phosphoric acid	C3H9O4P	C ₃ H ₉ O ₄ P	Methyl phosphate; Trimethoxyphosphine oxide	2
295	Heptafluoropropane	C3HF7	C ₃ HF ₇	1,1,1,2,3,3,3-Heptafluoropropane, Freon 227	2
296	Hexafluorocyclobutene	C4F6	C ₄ F ₆	Perfluorocyclobutene; 1,2,3,3,4,4-Hexafluorocyclobutene	3
297	Hexafluoro butadiene-1,3	C4F6	CF ₂ =CF-CF=CF ₂	Perfluorobutadiene-1,3;	3
298	Diethyl sulfide	C4H10S	C ₄ H ₁₀ S	UN 2375; Ethyl sulfide;	2
299	Tetramethoxygermanium	C4H12GeO4	(CH ₃ O) ₄ Ge	Ge(OMe) ₄	2
300	Dimethoxydimethyl silane	C4H12O2Si	(CH ₃ O) ₂ Si(CH ₃) ₂	KBM 22	2
301	Tetramethoxy silane	C4H12O4Si	(CH ₃ O) ₄ Si	Silicic Acid (H ₄ SiO ₄); Tetramethyl ester; Tetramethyl silicate	2
302	Tetramethyl lead	C4H12Pb	(CH ₃) ₄ Pb	(CH ₃) ₄ Pb; Plumbane, tetramethyl;	2
303	Trimethylvinylsilane	C5H12Si	C ₅ H ₁₂ Si	Vinyltrimethylsilane; CH ₂ =CHSi(CH ₃) ₃	2
304	Pyridine	C5H5N	C ₅ H ₅ N	Azabenzene; Azine	2
305	Methyl methacrylate polymer	C5H8O2	C ₅ H ₈ O ₂	Poly(methyl methacrylate);2-Methyl1-2-propenoic acid	2
306	Triethyl arsine	C6H15As	(C ₂ H ₅) ₃ As	Arsine; Triethylarsenic	2
307	Triethoxy arsine	C6H15AsO3	(C ₂ H ₅ O) ₃ As	Triethyl ester arsenous acid; Triethyl arsenite	2
308	Triethoxyborane	C6H15BO3	(C ₂ H ₅ O) ₃ B	Boron triethoxide	2
309	Triethylindium	C6H15In	(C ₂ H ₅) ₃ In	Indium triethyl	2
310	Triethylamine	C6H15N	(C ₂ H ₅) ₃ N	UN 1296; Ethanamine	2
311	Triethoxyphosphine	C6H15O3P	(C ₂ H ₅ O) ₃ P	Triethyl phosphite; UN 2323; Phosphorous acid, triethyl ester	2
312	Triethoxy silane	C6H16O3Si	(C ₂ H ₅ O) ₃ SiH		2
313	Triethyl silane	C6H16Si	(C ₂ H ₅) ₃ SiH	(C ₂ H ₅) ₃ SiH	2
314	Trimethylisoxazole	C6H9NO	CH ₃ CH=CHCH=CHCON H ₂	3,4,5-Trimethylisoxazole, Sorbamide	3
315	Tetraethylgermane	C8H20Ge	(C ₂ H ₅) ₄ Ge	(C ₂ H ₅) ₄ Ge; Germanium tetraethyl	2
316	Tetraethyl lead	C8H20Pb	(C ₂ H ₅) ₄ Pb	Plumbane, tetraethyl; UN 1649	2
317	Tetraethyl silane	C8H20Si	C ₈ H ₂₀ Si	Tetraethylsilane; Tetraethylsilicon; (C ₂ H ₅) ₄ Si	2
318	Tetrakis(dimethylamino)titanium	C8H24N4Ti	C ₈ H ₂₄ N ₄ Ti		2
319	Styrene	C8H8	C ₈ H ₈	Ethenylbenzene; UN 2055	2
320	Triallylamine	C9H15N	C ₉ H ₁₅ N		2

Code	Gas Name	Symbol	Formula	Synonym	Ref
321	Trifluoromethylhypofluorite	CF4O	CF ₄ O	CF ₃ OF; Hypofluorous acid; trifluoromethyl ester	2
322	Formaldehyde	CH2O	CH ₂ O	H2C0; UN 1198; BFV	2
323	Iodomethane	CH3I	CH ₃ I	Methyl iodide; Un 2644	2
324	Xenon difluoride	XeF2	XeF ₂	F ₂ Xe; Xenon fluoride	2
325	Selenium hexafluoride	SeF6	SeF ₆	UN 2194; Selenium fluoride	2
326	Disilane hexafluoride	SiF6	SiF ₆	F ₆ Si ₂ ; Hexafluorodisilane	2
327	Fluoro silane	SiH3F	SiH ₃ F	H ₃ FSi	2
328	Trisilane	Si3H8	Si ₃ H ₈	Silicopropane; Trisilicane; H ₈ Si3	2
329	Mercury	Hg	Hg	UN 2809	2
330	Zinc	Zn	Zn	UN 1383	2
331	Acetaldehyde methoxy	C3H6O2	CH ₃ OCH ₂ CHO		3
332	Acetone,hydroxy	C3H6O2	CH ₃ COCH ₂ OH	Acetol	3
333	Glycol methylene ether	C3H6O2	C ₃ H ₆ O ₂	1,3 - Dioxolane	3
334	Propanoic acid	C3H6O2	CH ₃ CH ₂ CO ₂ H	Propionic acid	3
335	Glycidol	C3H6O2	CH ₂ CHCH ₂ OH	1-Propanol, 2,3 epoxy	3
336	Butanol-2	C4H10O	CH ₃ CH ₂ CH(OH)CH ₃		3
337	Tertiary Butyl Alcohol	C4H10O	(CH ₃) ₃ COH		3
338	Diethyl ether	C4H10O	C ₂ H ₅ OC ₂ H ₅		3
339	Methyl propyl ether	C4H10O	CH ₃ OC ₃ H ₇		3
340	Methyl isopropyl ether	C4H10O	(CH ₃) ₂ CHOCH ₃		3
341	Isobutyl Alcohol	C4H10O	(CH ₃) ₂ CHCH ₂ OH		3
342	3-one-2,5-dimethyl hexadiene	C8H10	CH ₂ =C(CH ₃)C=CC(CH ₃)CH ₂		3
343	1,7-Octadiyne	C8H10	HC≡C(CH ₂) ₄ C≡CH		3
344	2,6-Octadiyne	C8H10	CH ₃ C≡CCH ₂ CH ₂ C≡CCH ₃		3
345	1,3,5,7-Octatetraene	C8H10	CH ₂ =CHCH=CHCH=CHCH=CH ₂		3
346	Niobium Pentachloride	NbCl5	NbCl ₅		3
347	Disilabutane	Si ₂ C ₂ H ₁₀	Si ₂ C ₂ H ₁₀		3
348	Ethane,1,1,1-Trifluoro	C2H3F3	C ₂ H ₃ F ₃	HFC-143a	3
349	Diselenium Dichloride	Se2Cl2	Se ₂ Cl ₂		3
350	Deuterium Ammonia	ND3	ND ₃		3
351	Perfluoro (Oxacyclopentane)	C4F8O	C ₄ F ₈ O		3

7 Gas Table Sorted by Name

Table 2 Gases Sorted by Name

Code	Gas Name	Symbol	Formula	Synonym	Ref
345	1,3,5,7-Octatetraene	C8H10	CH ₂ =CHCH=CHCH=CHCH=CH ₂		3
343	1,7-Octadiyne	C8H10	HC≡C(CH ₂) ₄ C≡CH		3
186	2,2 Dichloro1,1,1 Trifluoroethane	C2HCl2F3	CHCl ₂ -CF ₃	Freon 123, Suva 123	2
344	2,6-Octadiyne	C8H10	CH ₃ C≡CCH ₂ CH ₂ C≡CCH ₃		3
342	3-one-2,5-dimethyl hexadiene	C8H10	CH ₂ =C(CH ₃)C=CC(CH ₃)CH ₂		3

Code	Gas Name	Symbol	Formula	Synonym	Ref
178	4-Methyl, 1-Pentene	C6H12	(CH ₃) ₂ CHCH ₂ CH=CH ₂		2
331	Acetaldehyde methoxy	C3H6O2	CH ₃ OCH ₂ CHO		3
283	Acetic acid	C2H4O2	CH ₃ COOH	Ethanoic acid; UN 2789	2
184	Acetone	C3H6O	CH ₃ COCH ₃		2
332	Acetone, hydroxy	C3H6O2	CH ₃ COCH ₂ OH	Acetol	3
173	Acetonitrile	C2H3N	CH ₃ CN		2
42	Acetylene	C2H2	HC≡CH	Ethyne	1
289	Acrylic acid	C3H4O2	C ₃ H ₄ O ₂	2-Propenoic acid; CH ₂ =CHCOOH	2
276	Acrylonitrile	C3H3N	CH ₂ =CHCN	Acrylon; Propenenitrile	3
8	Air	Air			1
66	Allene	C3H4	CH ₂ =C=CH ₂	Propadiene	1
226	Aluminum Trifluoride	AlF3	AlF ₃		2
29	Ammonia	NH3	NH ₃		1
4	Argon	Ar	Ar		1
96	Arsenic Pentafluoride	AsF5	AsF ₅		2
242	Arsenic Tribromide	AsBr3	AsBr ₃		2
216	Arsenic Trichloride	AsCl3	AsCl ₃		2
195	Arsenic Trifluoride	AsF3	AsF ₃		2
196	Arsenic Triiodine	AsI3	AsI ₃		2
35	Arsine	AsH3	AsH ₃		1
197	Benzene	C6H6	C ₆ H ₆		2
198	Borazine	B3N3H6	H ₃ B ₃ N ₃ H ₃		14
79	Boron Tribromide	BBr3	BBr ₃		1
70	Boron Trichloride	BCl3	BCl ₃		1
48	Boron Trifluoride	BF3	BF ₃		1
21	Bromine	Br2	Br ₂		2
116	Bromine Pentafluoride	BrF5	BrF ₅		1
76	Bromine Trifluoride	BrF3	BrF ₃		1
199	Bromochlorodifluoromethane	BrClF2	BrClCF ₂		2
105	Bromotrifluoroethylene	C2BrF3	CF ₂ CFBr		1
80	Bromotrifluoromethane	CBrF3	BrCF ₃	F-13B1, R-13B1	1
100	Butadiene	C4H6	CH ₂ =C=CHCH ₃	Methylallene	1
117	Butane	C4H10	CH ₃ (CH ₂) ₂ CH ₃		1
271	Butanol-1	C4H10O	CH ₃ CH ₂ CH ₂ CH ₂ OH		3
336	Butanol-2	C4H10O	CH ₃ CH ₂ CH(OH)CH ₃		3
104	Butene	C4H8	CH ₃ CH ₂ CH=CH ₂	1-Butene	1
25	Carbon Dioxide	CO2	CO ₂		1
40	Carbon Disulfide	CS2	CS ₂		2
9	Carbon Monoxide	CO	CO		1
200	Carbon Tetrabromide	CBr4	CBr ₄		2
101	Carbon Tetrachloride	CCl4	CCl ₄	Tetrachloromethane or Methane, Tetrachloro	2
63	Carbon Tetrafluoride	CF4	CF ₄	Tetrafluoromethane or Methane, Tetrafluoro	1

Code	Gas Name	Symbol	Formula	Synonym	Ref
46	Carbonyl Fluoride	CF2O	CF ₂ O		1
34	Carbonyl Sulfide	COS	COS		1
19	Chlorine	Cl2	Cl ₂		1
201	Chlorine Dioxide	ClO2	ClO ₂		2
202	Chlorine Pentafluoride	ClF5	ClF ₅		2
77	Chlorine Trifluoride	ClF3	ClF ₃		1
172	Chlorobenzene	C6H5Cl	C ₆ H ₅ Cl	Chlorobenzol, Phenylchloride	2
203	Chlorodifluoroethane	C2H3ClF2	CH ₃ -CF ₂ Cl	R-142b	4
204	Chlorodifluoroethylene	C2HClF2	CF ₂ =CHCl	R-1122, FREON-1122	4
57	Chlorodifluoromethane	CHClF2	CClHF ₂	F-22, R-22	1
71	Chloroform	CHCl3	CHCl ₃	Trichloromethane or Methane, Trichloro	2
119	Chloropentafluoroethane	C2ClF5	ClCF ₂ CF ₃	F-115, R-115	1
205	Chlorosilane	SiH3Cl	SiH ₃ Cl		2
206	Chlorotrifluoroethylene	C2ClF3	FCCl=CF ₂	R-1113, FREON-1113	2
74	Chlorotrifluoromethane	CClF3	ClCF ₃	F-13, R-13	1
107	Cisbutene	C4H8	CH ₃ CH=CHCH ₃	Cis-2-Butene	2
59	Cyanogen	C2N2	NCCN	Oxalodinitrile	1
37	Cyanogen Chloride	ClCN	ClCN		1
207	Cyclobutane	C4H8	C ₄ H ₈	Tetramethylene	2
61	Cyclopropane	C3H6	C ₃ H ₆		1
14	Deuterium	D2	H ₂ ²	D2	2
350	Deuterium Ammonia	ND3	ND ₃		3
244	Deuteriumsilane	SiD4	SiH ₄ ²		2
208	Diazomethane	CH2N2	CH ₂ N ₂	Acomethylene	2
58	Diborane	B2H6	B ₂ H ₆		1
209	Dibromodifluoromethane	CBr2F2	Br ₂ CF ₂	R-12B2, FREON-12B2	2
130	Dibromotetrafluorethane	C2Br2F4	BrF ₂ CCF ₂ Br	F-114B2, R-114B2	1
84	Dichlorodifluoromethane	CCl2F2	CCl ₂ F ₂	F-12, R-12	1
212	Dichlorodimethylsilane	C2H6SiCl2	(CH ₃) ₂ SiCl ₂		2
210	Dichloroethylene	C2H2Cl2	CH ₂ =CCl ₂	Vinylidene Chloride	2
211	Dichloroethylene -cis	C2H2Cl2	CHCl=CHCl		2
191	Dichloroethylene -trans	C2H2Cl2	CHCl=CHCl		2
65	Dichlorofluoromethane	CHCl2F	CHCl ₂ F	F-21, R-21	1
265	Dichloromethane	CH2Cl2	CH ₂ Cl ₂		
67	Dichlorosilane	SiH2Cl2	SiH ₂ Cl ₂		1
125	Dichlorotetrafluoroethane	C2Cl2F4	F ₃ CCCl ₂ F	F-114, R-114	1
188	Diethoxy Dimethyl Silane	C6H16O2Si	(C ₂ H ₅ O) ₂ Si(CH ₃) ₂		2
338	Diethyl ether	C4H10O	C ₂ H ₅ OC ₂ H ₅		3
298	Diethyl sulfide	C4H10S	C ₄ H ₁₀ S	UN 2375; Ethyl sulfide;	2
213	Diethylamine	C4H11N	(C ₂ H ₅) ₂ NH		2
154	Diethylsilane	C4H12Si	(C ₂ H ₅) ₂ SiH ₂		2
214	Diethylzinc	C4H10Zn	Zn(C ₂ H ₅) ₂		2
232	Difluoroamidogen	NF2	NF ₂		2

Code	Gas Name	Symbol	Formula	Synonym	Ref
103	Difluorochloroethane	C2H3ClF2	CF ₂ ClCH ₃	F-142B, R-142B	1
82	Difluoroethane	C2H4F2	CH ₃ CHF ₂	Ethyldene Fluoride, R-152A	1
64	Difluoroethylene	C2H2F2	CH ₂ =CF ₂	G-1132A, Vinylidenefluoride	1
160	Difluoromethane	CH2F2	CH ₂ F ₂	Methylene Fluoride	2
134	Difluorosilane	SiH2F2	SiH ₂ F ₂		10
217	Digermane	Ge2H6	Ge ₂ H ₆		2
300	Dimethoxydimethyl silane	C4H12O2Si	(CH ₃ O) ₂ Si(CH ₃) ₂	KBM 22	2
73	Dimethyl Ether	C2H6O	CH ₃ OCH ₃	Methylether	1
284	Dimethyl selenide	C2H6Se	C ₂ H ₆ Se	(CH ₃) ₂ Se; Selenium dimethyl; Dimethylselenium	2
164	Dimethylaluminum-hydride	C2H7Al	(CH ₃) ₂ AlH	DMAH	13
85	Dimethylamine	C2H7N	(CH ₃) ₂ NH		1
218	Dimethylcadmium	C2H6Cd	(CH ₃) ₂ Cd		2
166	Dimethylethylaminealane	C4H14NaI	(CH ₃) ₂ C ₂ H ₅ NaIH ₃	DMEAA	14
122	Dimethylpropane	C5H12	(CH ₃) ₄ C	Neopentane	2
219	Dimethylsilane	C2H8Si	(CH ₃) ₂ SiH ₂		2
220	Dimethyltellurium	C2H6Te	(CH ₃) ₂ Te		2
135	Dimethylzinc	C2H6Zn	(CH ₃) ₂ Zn		3
281	Diphenylmethan-4,4' -diisocyanat	C15H10N2O	C ₆ H ₁₀ N ₂ O	UN 2489; Benzene,1,1' - methylenebis(isocyanatophenyl)	2
280	Diphenylmethylenediamine	C13H14N2	C ₁₃ H ₁₄ N ₂		2
349	Diselenium Dichloride	Se2Cl2	Se ₂ Cl ₂		3
347	Disilabutane	Si2C2H10	Si ₂ C ₂ H ₁₀		3
97	Disilane	Si2H6	Si ₂ H ₆		2
326	Disilane hexafluoride	SiF6	SiF ₆	F ₆ Si ₂ ; Hexafluorodisilane	2
54	Ethane	C2H6	CH ₃ CH ₃		1
348	Ethane, 1,1,1-Trifluoro	C2H3F3	C ₂ H ₃ F ₃	HFC-143a	3
136	Ethanol	C2H6O	CH ₃ CH ₂ OH		2
285	Ethoxy silane	C2H8OSi	C ₂ H ₈ OSi		2
93	Ethyl Acetylene	C4H6	CH ₃ CH ₂ C≡CH		1
75	Ethyl Chloride	C2H5Cl	C ₂ H ₅ Cl	Chloroethane or Ethane, Chloro or Ethyl Chloride	1
221	Ethyl Fluoride	C2H5F	CH ₃ CH ₂ F	Fluoroethane, R-161, FREON-161	2
291	Ethyl Formate	C3H6O2	HCO ₂ C ₂ H ₅	Ethyl ester formic acid; HC00C2H5	3
174	Ethylbenzene	C8H10	C ₆ H ₅ C ₂ H ₅		2
38	Ethylene	C2H4	CH ₂ =CH ₂	Ethene	1
222	Ethylene Dichloride	C2H4Cl2	ClCH ₂ CH ₂ Cl	1,2 Dichloroethane	2
45	Ethylene Oxide	C2H4O	C ₂ H ₄ O	Acetaldehyde	1
169	Ethyleneglycol	C2H6O2	HOCH ₂ CH ₂ OH	Ehtanediol, Glycol	2
18	Fluorine	F2	F ₂		1
327	Fluoro silane	SiH3F	SiH ₃ F	H ₃ FSi	2
223	Fluoroacetylene	C2HF	FC≡CH		2
49	Fluoroform	CHF3	CHF ₃	Trifluoromethane or Methane, Trifluoro, F-23, R-23	1

Code	Gas Name	Symbol	Formula	Synonym	Ref
224	Fluorotriethoxysilane	C6H15OSiF	(C ₂ H ₅ O) ₃ SiF		2
322	Formaldehyde	CH2O	CH ₂ O	H2C0; UN 1198; BFV	2
43	Germane	GeH ₄	GeH ₄		1
113	Germanium Tetrachloride	GeCl ₄	GeCl ₄	Tetrachlorogerlane	2
99	Germanium Tetrafluoride	GeF ₄	GeF ₄	Tetrafluorogerlane	2
335	Glycidol	C3H6O ₂	CH ₂ CHCH ₂ OH	1-Propanol, 2,3 epoxy	3
333	Glycol methylene ether	C3H6O ₂	C ₃ H ₆ O ₂	1,3 - Dioxolane	3
275	Hafnium Tetranitrate	HfN4O ₁₂	Hf(NO ₃) ₄		1
137	Halothane	C2HBrClF ₃	BrClHCCF ₃		6
1	Helium	He	He		1
295	Heptafluoropropane	C3HF ₇	C ₃ HF ₇	1,1,1,2,3,3,3-Heptafluoropropane, Freon 227	2
272	Hexafluoro Acetylacetone	C5H2F6O ₂	C ₅ H ₂ F ₆ O ₂		1
297	Hexafluoro butadiene-1,3	C4F ₆	CF ₂ =CF-CF=CF ₂	Perfluorobutadiene-1,3;	3
267	Hexafluoro Propane	C3H2F ₆	CH ₂ FCF ₂ CF ₃	1,1,1,2,2,3-Hexafluoropropane	2
270	Hexafluoro-2-Butyne	C4F ₆	CF ₃ C≡CCF ₃	Bis(trifluoromethyl)acetylene; Perfluoro-2-butyne	3
225	Hexafluoroacetone	C3F6O	(CF ₃) ₂ CO		2
192	Hexafluorobenzene	C6F ₆	C ₆ F ₆		2
296	Hexafluorocyclobutene	C4F ₆	C ₄ F ₆	Perfluorocyclobutene; 1,2,3,3,4,4-Hexafluorocyclobutene	3
118	Hexafluoroethane	C2F ₆	F ₃ CCF ₃	F-116, Perfluoroethane	1
138	Hexafluoropropylene	C3F ₆	CF ₃ CF=CF ₂	Perfluoropropylene or Propylene, Perfluoro	1
286	Hexafluoropropylene oxide	C3F6O	C ₃ F ₆ O	Hexafluoroepoxypropane	2
139	Hexamethyldisilane	C6H18Si ₂	(CH ₃) ₃ Si ₂ (CH ₃) ₃	HMDSi, HMDS	3
227	Hexamethyldisilazane	C6H19Si ₂ N	(CH ₃) ₆ Si ₂ NH		2
228	Hexamethyldisiloxane	C6H18Si ₂ O	(CH ₃) ₆ Si ₂ O		2
127	Hexane	C6H ₁₄	CH ₃ (CH ₂) ₄ CH ₃		2
170	Hexanediol-1,6	C6H14O ₂	HO(CH ₂) ₆ OH	Hexyleneglycol, Hexamethyleneglycol	2
50	Hydrazine	N2H ₄	H ₂ NNH ₂		2
269	Hydrazoic Acid	HN ₃	HN ₃		1
7	Hydrogen	H ₂	H ₂		1
10	Hydrogen Bromide	HBr	HBr		1
11	Hydrogen Chloride	HCl	HCl		1
24	Hydrogen Cyanide	HCN	HCN		1
12	Hydrogen Fluoride	HF	HF		1
17	Hydrogen Iodide	HI	HI		1
23	Hydrogen Selenide	H ₂ Se	H ₂ Se		1
22	Hydrogen Sulfide	H ₂ S	H ₂ S		1
229	Hydrogen telluride	H ₂ Te	H ₂ Te		2
90	Intentionally Left Blank				
92	Intentionally Left Blank				
175	Intentionally Left Blank				

Code	Gas Name	Symbol	Formula	Synonym	Ref
115	Iodine Pentafluoride	IF5	IF ₅		1
323	Iodomethane	CH3I	CH ₃ I	Methyl iodide; Un 2644	2
230	Iron Carbonyl	C5O5Fe	Fe(CO) ₅		2
111	Isobutane	C4H10	(CH ₃) ₂ CHCH ₃	2-Methylpropane or Propane, 2-Methyl	1
106	Isobutene	C4H8	(CH ₃) ₂ C=CH ₂	Isobutylene, Methylpropene	2
341	Isobutyl Alcohol	C4H10O	(CH ₃) ₂ CHCH ₂ OH		3
231	Isopentane	C5H12	CH ₃ CH ₂ CH(CH ₃) ₂	2-Methylbutane	2
187	Isopropal Alcohol	C3H8O	(CH ₃) ₂ CHOH	2-Propanol	2
5	Krypton	Kr	Kr		1
329	Mercury	Hg	Hg	UN 2809	2
28	Methane	CH4	CH ₄		1
176	Methanol	CH4O	CH ₃ OH	Methyl Alcohol	2
292	Methyl acetate	C3H6O2	CH ₃ CO ₂ CH ₃	Methyl ester acetic acid; UN 1231	3
68	Methyl Acetylene	C3H4	CH ₃ C≡CH	Propyne	1
44	Methyl Bromide	CH3Br	CH ₃ Br	Bromomethane or Methane, Bromo	1
36	Methyl Chloride	CH3Cl	CH ₃ Cl	Chloromethane or Methane, Chlоро	1
33	Methyl Fluoride	CH3F	CH ₃ F	Fluoromethane or Methane, Fluoro	1
340	Methyl isopropyl ether	C4H10O	(CH ₃) ₂ CHOCH ₃		3
47	Methyl Mercaptan	CH4S	CH ₃ SH		1
305	Methyl methacrylate polymer	C5H8O2	C ₅ H ₈ O ₂	Poly(methyl methacrylate); 2-Methyl 1-2-propenoic acid	2
339	Methyl propyl ether	C4H10O	CH ₃ OC ₃ H ₇		3
81	Methyl Vinyl Ether	C3H6O	CH ₃ OCH=CH ₂		1
52	Methylamine	CH5N	CH ₃ NH ₂	Amino Methane, Monomethylamine	2
120	Methylbutene	C5H10	CH ₃ CH ₂ CCH ₃ =CH ₂	2-Methyl-1-Butene	1
177	Methylcyclohexane	C7H14	CH ₃ C ₆ H ₁₁	Hexahydrotoluene	2
268	Methylene Bromide	CH2Br2	CH ₂ Br ₂	UN 2664; Methyl dibromide, Dibromomethane	1
185	Methylsilane	CH6Si	CH ₃ SiH ₃	Monomethylsilane	2
183	Methyltrichlorosilane	CH3Cl3Si	CH ₃ SiCl ₃	MTS	2
124	Molybdenum Hexafluoride	MoF6	MoF ₆		2
233	Monoethylamine	C2H7N	C ₂ H ₅ NH ₂		2
234	Monomethyl hydrazine	CH6N2	CH ₃ N ₂ H ₃		2
2	Neon	Ne	Ne		1
140	Nickel Carbonyl	C4O4Ni	Ni(CO) ₄		1
346	Niobium Pentachloride	NbCl5	NbCl ₅		3
167	Nitric Acid	HNO3	HNO ₃		2
16	Nitric Oxide	NO	NO		2
13	Nitrogen	N2	N ₂		1
26	Nitrogen Dioxide	NO2	NO ₂		1
95	Nitrogen Tetroxide	N2O4	N ₂ O ₄	Dinitrogenoxide	2

Code	Gas Name	Symbol	Formula	Synonym	Ref
53	Nitrogen Trifluoride	NF ₃	NF ₃		1
78	Nitrogen Trioxide	N ₂ O ₃	N ₂ O ₃		1
235	Nitromethane	CH ₃ NO ₂	CH ₃ NO ₂		2
141	Nitrosyl Chloride	NOCl	NOCl		1
27	Nitrous Oxide	N ₂ O	N ₂ O		1
236	Octafluorobutane	C ₄ F ₈	C ₄ F ₈		3
129	Octafluorocyclobutane	C ₄ F ₈	(CF ₂) ₄	Perfluorocyclobutane or Cyclobutane, Perfluoro	1
266	Octafluorocyclopentene	C ₅ F ₈	CF ₂ =C(CF ₃)-CF=CF ₂		3
237	Octane	C ₈ H ₁₈	CH ₃ (CH ₂) ₆ CH ₃		2
15	Oxygen	O ₂	O ₂		1
238	Oxygen Dichloride	OCl ₂	OCl ₂		2
41	Oxygen Difluoride	OF ₂	OF ₂		1
179	o-Xylene	C ₈ H ₁₀	1,2-(CH ₃) ₂ C ₆ H ₄	1,2-Dimethylbenzene	2
30	Ozone	O ₃	O ₃		1
142	Pentaborane	B ₅ H ₉	B ₅ H ₉		2
239	Pentaborane(11)	B ₅ H ₁₁	B ₅ H ₁₁		2
155	Pentafluoroethane	C ₂ HF ₅	CF ₃ CHF ₂	F-125, R-125	9
288	Pentafluoropropanol	C ₃ H ₃ F ₅ O	C ₂ F ₅ CH ₂ OH	Perfluorodihydropropanol, 1,1,1,2,2-Pentafluoropropane	2
240	Pentane	C ₅ H ₁₂	CH ₃ (CH ₂) ₃ CH ₃		2
72	Perchloryl Fluoride	ClO ₃ F	ClO ₃ F		1
351	Perfluoro (Oxacyclopentane)	C ₄ F ₈ O	C ₄ F ₈ O		3
241	Perfluorobutane	C ₄ F ₁₀	C ₄ F ₁₀		3
128	Perfluoropropane	C ₃ F ₈	CF ₂ (CF ₃) ₂		1
180	Phenol	C ₆ H ₆ O	C ₆ H ₅ OH		2
60	Phosgene	CCl ₂ O	CCl ₂ O	Carbonyl Chloride	1
31	Phosphine	PH ₃	PH ₃		1
102	Phosphorous Oxychloride	POCl ₃	POCl ₃		2
143	Phosphorus Pentafluoride	PF ₅	PF ₅		1
193	Phosphorus Trichloride	PCL ₃	PCl ₃		2
62	Phosphorus Trifluoride	PF ₃	PF ₃		1
89	Propane	C ₃ H ₈	CH ₃ CH ₂ CH ₃		1
334	Propanoic acid	C ₃ H ₆ O ₂	CH ₃ CH ₂ CO ₂ H	Propionic acid	3
293	Propenamine	C ₃ H ₇ N	C ₃ H ₇ N	Allylamine; Monoallylamine; UN 2334	2
69	Propylene	C ₃ H ₆	CH ₃ CH=CH ₂	Propene	1
304	Pyridine	C ₅ H ₅ N	C ₅ H ₅ N	Azabenzene; Azine	2
3	Radon	Rn	Rn		2
243	Rhenium Hexafluoride	ReF ₆	ReF ₆		2
325	Selenium hexafluoride	SeF ₆	SeF ₆	UN 2194; Selenium fluoride	2
39	Silane	SiH ₄	SiH ₄		1
278	Silicon tetrabromide	Br ₄ Si	Br ₄ Si	SiBr ₄ ; Tetrabromosilane; Silicon (IV) bromide	2
108	Silicon Tetrachloride	SiCl ₄	SiCl ₄	Tetrachlorosilane	2

Code	Gas Name	Symbol	Formula	Synonym	Ref
88	Silicon Tetrafluoride	SiF ₄	SiF ₄		1
245	Stibine	SbH ₃	SbH ₃		2
319	Styrene	C ₈ H ₈	C ₈ H ₈	Ethenylbenzene; UN 2055	2
32	Sulfur Dioxide	SO ₂	SO ₂		1
110	Sulfur Hexafluoride	SF ₆	SF ₆		1
189	Sulfur Monochloride	S ₂ Cl ₂	S ₂ Cl ₂		2
86	Sulfur Tetrafluoride	SF ₄	SF ₄		1
246	Sulfur Trioxide	SO ₃	SO ₃		2
171	Sulfuric Acid	H ₂ SO ₄	H ₂ SO ₄		2
87	Sulfuryl Fluoride	SO ₂ F ₂	SO ₂ F ₂		1
279	Tantalum (V) ethoxide	C ₁₀ H ₂₅ O ₅ Ta	C ₁₀ H ₂₅ O ₅ Ta	Ta(Oet) ₅	2
274	TEAsat	C ₆ H ₁₅ O ₄ As	(C ₂ H ₅ O) ₃ AsO		1
247	Tellurium Hexafluoride	TeF ₆	TeF ₆		2
337	Tertiary Butyl Alcohol	C ₄ H ₁₀ O	(CH ₃) ₃ COH		3
161	Tertiarybutylarsine	C ₄ H ₁₁ As	C(CH ₃) ₃ AsH ₂	TBA	8
162	Tertiarybutylphosphine	C ₄ H ₁₁ P	C(CH ₃) ₃ PH ₂	TBP	8
248	Tetrachlorodiborane	B ₂ Cl ₄	B ₂ Cl ₄		2
168	Tetrachloroethylene	C ₂ Cl ₄	Cl ₂ C=CCl ₂	Perchloroethylene or Ethylene, Perchloro	2
144	Tetraethoxysilane	C ₈ H ₂₀ O ₄ Si	(C ₂ H ₅ O) ₄ Si	TEOS	2
316	Tetraethyl lead	C ₈ H ₂₀ Pb	(C ₂ H ₅) ₄ Pb	Plumbane, tetraethyl; UN 1649	2
317	Tetraethyl silane	C ₈ H ₂₀ Si	C ₈ H ₂₀ Si	Tetraethylsilane; Tetraethylsilicon; (C ₂ H ₅) ₄ Si	2
315	Tetraethylgermane	C ₈ H ₂₀ Ge	(C ₂ H ₅) ₄ Ge	(C ₂ H ₅) ₄ Ge; Germanium tetraethyl	2
94	Tetrafluorethylene	C ₂ F ₄	F ₂ C=CF ₂		1
249	Tetrafluorodiborane	B ₂ F ₄	B ₂ F ₄		2
156	Tetrafluoroethane	C ₂ H ₂ F ₄	CH ₂ FCF ₃	R-134A, F-134A	2
157	Tetrafluorohydrazine	N ₂ F ₄	F ₂ NNF ₂	Dinitrogen Tetrafluoride	1
182	Tetrahydrofuran	C ₄ H ₈ O	C ₄ H ₈ O		2
282	Tetrakis(diethylamino)titanium	C ₁₆ H ₄₀ N ₄ Ti	C ₁₆ H ₄₀ N ₄ Ti		2
318	Tetrakis(dimethylamino)titanium	C ₈ H ₂₄ N ₄ Ti	C ₈ H ₂₄ N ₄ Ti		2
301	Tetramethoxy silane	C ₄ H ₁₂ O ₄ Si	(CH ₃ O) ₄ Si	Silicic Acid (H ₄ SiO ₄); Tetramethyl ester; Tetramethyl silicate	2
299	Tetramethoxygermanium	C ₄ H ₁₂ GeO ₄	(CH ₃ O) ₄ Ge	Ge(OMe) ₄	2
302	Tetramethyl lead	C ₄ H ₁₂ Pb	(CH ₃) ₄ Pb	(CH ₃) ₄ Pb; Plumbane, tetramethyl;	2
252	Tetramethyl Tin	C ₄ H ₁₂ Sn	(CH ₃) ₄ Sn		2
158	Tetramethylcyclotetra-siloxane	C ₄ H ₁₆ Si ₄ O ₄	(CH ₃) ₄ H ₄ (SiO) ₄	TOMCATS	7
250	Tetramethylgermanium	C ₄ H ₁₂ Ge	(CH ₃) ₄ Ge		2
251	Tetramethylsilane	C ₄ H ₁₂ Si	(CH ₃) ₄ Si		2
253	Terasilane	Si ₄ H ₁₀	Si ₄ H ₁₀		2
145	Tin Tetrachloride	SnCl ₄	SnCl ₄	Tetrachlorostannane	2
114	Titanium Tetrachloride	TiCl ₄	TiCl ₄		2
254	Titanium Tetraiodide	TiI ₄	TiI ₄		2

Code	Gas Name	Symbol	Formula	Synonym	Ref
194	Titanium Tetraisopropoxide	C12H28OTi	Ti(OC ₃ H ₇) ₄		1
181	Toluene	C7H8	C ₆ H ₅ CH ₃	Methylbenzene	2
98	Transbutene	C4H8	CH ₃ CH=CHCH ₃		2
320	Triallylamine	C9H15N	C ₉ H ₁₅ N		2
83	Tribromomethane	CHBr3	CHBr ₃		2
255	Tribromostibine	SbBr3	SbBr ₃		2
146	Tributylaluminum	C12H27Al	(CH ₃ CH ₂ CH ₂ CH ₂) ₃ Al	TBAI	3
112	Trichloroethane	C2H3Cl3	CH ₃ CCl ₃	TCA, Methylchloroform	2
91	Trichlorofluoromethane	CCl3F	CCl ₃ F	F-11, R-11	1
147	Trichlorosilane	SiHCl3	SiHCl ₃		5
256	Trichlorostibine	SbCl3	SbCl ₃		2
126	Trichlorotrifluoroethane	C2Cl3F3	CF ₂ ClCCl ₂ F	F-113, R-113	1
312	Triethoxy silane	C6H16O3Si	(C ₂ H ₅ O) ₃ SiH		2
308	Triethoxyborane	C6H15BO3	(C ₂ H ₅ O) ₃ B	Boron triethoxide;	2
311	Triethoxyphosphine	C6H15O3P	(C ₂ H ₅ O) ₃ P	Triethyl phosphite; UN 2323; Phosphorous acid, triethyl ester	2
306	Triethyl arsine	C6H15As	(C ₂ H ₅) ₃ As	Arsine; Triethylarsenic	2
313	Triethyl silane	C6H16Si	(C ₂ H ₅) ₃ SiH	(C ₂ H ₅) ₃ SiH	2
257	Triethylaluminum	C6H15Al	(C ₂ H ₅) ₃ Al		2
310	Triethylamine	C6H15N	(C ₂ H ₅) ₃ N	UN 1296; Ethanamine	2
258	Triethylantimony	C6H15Sb	(C ₂ H ₅) ₃ Sb		2
163	Triethylborate	C6H15O3B	B(OC ₂ H ₅) ₃	TEB, Triethoxyborane	2
148	Triethylgallium	C6H15Ga	(C ₂ H ₅) ₃ Ga	TEGa	4
309	Triethylindium	C6H15In	(C ₂ H ₅) ₃ In	Indium triethyl	2
307	Triethoxy arsine	C6H15AsO3	(C ₂ H ₅ O) ₃ As	Triethyl ester arsenous acid; Triethyl arsenite	2
259	Trifluoroacetic Acid	CF3CO2H	CF ₃ CO ₂ H		2
260	Trifluoroacetonitrile	C2F3N	F ₃ CCN		2
321	Trifluoromethylhypofluorite	CF4O	CF ₄ O	CF ₃ OF; Hypofluorous acid; trifluoromethyl ester	2
290	Trifluoropropane	C3H5F3	C ₃ H ₅ F ₃	1,1,1-Trifluoropropane; CH ₃ CH ₂ CF ₃	2
261	Trifluorosilane	SiHF3	SiHF ₃		2
262	Triisobutylaluminum	C12H27Al	(C ₄ H ₉) ₃ Al		2
287	Trimethoxy silane	C3H10O3Si	C ₃ H ₁₀ O ₃ Si		2
131	Trimethoxyborine	C3H9BO3	B(OCH ₃) ₃	TMB, Trimethylborate	2
294	Trimethyl ester phosphoric acid	C3H9O4P	C ₃ H ₉ O ₄ P	Methyl phosphate; Trimethoxyphosphine oxide	2
190	Trimethyl Silane	C3H10Si	(CH ₃) ₃ SiH		2
149	Trimethylaluminum	C3H9Al	Al(CH ₃) ₃	TMA, TMAI	4
109	Trimethylamine	C3H9N	(CH ₃) ₃ N	Methylamine	1
165	Trimethylaminealane	C3H12AlN	(CH ₃) ₃ NAIH ₃	TMAA	11
150	Trimethylantimony	C3H9Sb	(CH ₃) ₃ Sb	Trimethylstibene	2
151	Trimethylarsenic	C3H9As	(CH ₃) ₃ As	Trimethylarsine, TMAs	2
277	Trimethylborane	C3H9B	(CH ₃) ₃ B		2
152	Trimethylgallium	C3H9Ga	Ga(CH ₃) ₃	TMGa	4

Code	Gas Name	Symbol	Formula	Synonym	Ref
153	Trimethylindium	C3H9In	(CH ₃) ₃ In	TMIn	3
314	Trimethylisoxazole	C6H9NO	CH ₃ CH=CHCH=CHCONH ₂	3,4,5-Trimethylisoxazole, Sorbamide	3
133	Trimethylphosphite	C3H9PO ₃	(CH ₃ O) ₃ P	TMPi, Trimethoxyphosphine	2
132	Trimethylphosphorous	C3H9P	(CH ₃) ₃ P	Trimethylphosphine, TMP	2
303	Trimethylvinylsilane	C5H ₁₂ Si	C ₅ H ₁₂ Si	Vinyltrimethylsilane; CH ₂ =CHSi(CH ₃) ₃	2
328	Trisilane	Si ₃ H ₈	Si ₃ H ₈	Silicopropane; Trisilicane; H ₈ Si ₃	2
159	Tritium	T ₂	H ₃ ²	T ₂	2
273	Tungsten Hexacarbonyl	C ₆ O ₆ W	W(CO) ₆		1
121	Tungsten Hexafluoride	WF ₆	WF ₆		2
123	Uranium Hexafluoride	UF ₆	UF ₆		2
56	Vinyl Bromide	C ₂ H ₃ Br	CH ₂ =CHBr		1
55	Vinyl Chloride	C ₂ H ₃ Cl	CH ₂ =CHCl	Chloroethylene	1
51	Vinyl Fluoride	C ₂ H ₃ F	H ₂ C=CHF		1
20	Water Vapor	H ₂ O	H ₂ O		2
6	Xenon	Xe	Xe		1
324	Xenon difluoride	XeF ₂	XeF ₂	F ₂ Xe; Xenon fluoride	2
263	Xylene m-	C ₈ H ₁₀	1,3-(CH ₃) ₂ C ₆ H ₄	1,3 Dimethyl Benzene	3
264	Xylene p-	C ₈ H ₁₀	1,4-(CH ₃) ₂ C ₆ H ₄	1,4 Dimethyl Benzene	3
330	Zinc	Zn	Zn	UN 1383	2

8 Gas Table Sorted by Symbol

Table 3 Gases Sorted by Symbol

Code	Gas Name	Symbol	Formula	Synonym	Ref
8	Air	Air			1
226	Aluminum Trifluoride	AlF ₃	AlF ₃		2
4	Argon	Ar	Ar		1
242	Arsenic Tribromide	AsBr ₃	AsBr ₃		2
216	Arsenic Trichloride	AsCl ₃	AsCl ₃		2
195	Arsenic Trifluoride	AsF ₃	AsF ₃		2
96	Arsenic Pentafluoride	AsF ₅	AsF ₅		2
35	Arsine	AsH ₃	AsH ₃		1
196	Arsenic Triiodine	AsI ₃	AsI ₃		2
248	Tetrachlorodiborane	B ₂ Cl ₄	B ₂ Cl ₄		2
249	Tetrafluorodiborane	B ₂ F ₄	B ₂ F ₄		2
58	Diborane	B ₂ H ₆	B ₂ H ₆		1
198	Borazine	B ₃ N ₃ H ₆	H ₃ B ₃ N ₃ H ₆		14
239	Pentaborane(11)	B ₅ H ₁₁	B ₅ H ₁₁		2
142	Pentaborane	B ₅ H ₉	B ₅ H ₉		2
79	Boron Tribromide	BBr ₃	BBr ₃		1
70	Boron Trichloride	BCl ₃	BCl ₃		1
48	Boron Trifluoride	BF ₃	BF ₃		1

Code	Gas Name	Symbol	Formula	Synonym	Ref
21	Bromine	Br2	Br ₂		2
278	Silicon tetrabromide	Br4Si	Br ₄ Si	SiBr ₄ ; Tetrabromosilane; Silicon (IV) bromide	2
76	Bromine Trifluoride	BrF3	BrF ₃		1
116	Bromine Pentafluoride	BrF5	BrF ₅		1
279	Tantalum (V) ethoxide	C10H25O5Ta	C ₁₀ H ₂₅ O ₅ Ta	Ta(Oet) ₅	2
146	Tributylaluminum	C12H27Al	(CH ₃ CH ₂ CH ₂ CH ₂) ₃ Al	TBAI	3
262	Triisobutylaluminum	C12H27Al	(C ₄ H ₉) ₃ Al		2
194	Titanium Tetraisopropoxide	C12H28OTi	Ti(OC ₃ H ₇) ₄		1
280	Diphenylmethylenediamine	C13H14N2	C ₁₃ H ₁₄ N ₂		2
281	Diphenylmethan-4,4' - diisocyanat	C15H10N2O	C ₁₅ H ₁₀ N ₂ O	UN 2489; Benzene,1,1' - methylenebis(isocyanatophenyl)	2
282	Tetrakis(diethylamino)titanium	C16H40N4Ti	C ₁₆ H ₄₀ N ₄ Ti		2
130	Dibromotetrafluoroethane	C2Br2F4	BrF ₂ CCF ₂ Br	F-114B2, R-114B2	1
105	Bromotrifluoroethylene	C2BrF3	CF ₂ CFBr		1
125	Dichlorotetrafluoroethane	C2Cl2F4	F ₃ CCCl ₂ F	F-114, R-114	1
126	Trichlorotrifluoroethane	C2Cl3F3	CF ₂ ClCCl ₂ F	F-113, R-113	1
168	Tetrachloroethylene	C2Cl4	Cl ₂ C=CCl ₂	Perchloroethylene or Ethylene, Perchloro	2
206	Chlorotrifluoroethylene	C2ClF3	FCCl=CF ₂	R-1113, FREON-1113	2
119	Chloropentafluoroethane	C2ClF5	ClCF ₂ CF ₃	F-115, R-115	1
260	Trifluoroacetonitrile	C2F3N	F ₃ CCN		2
94	Tetrafluoroethylene	C2F4	F ₂ C=CF ₂		1
118	Hexafluoroethane	C2F6	F ₃ CCF ₃	F-116, Perfluoroethane	1
42	Acetylene	C2H2	HC≡CH	Ethyne	1
191	Dichloroethylene -trans	C2H2Cl2	CHCl=CHCl		2
210	Dichloroethylene	C2H2Cl2	CH ₂ =CCl ₂	Vinylidene Chloride	2
211	Dichloroethylene -cis	C2H2Cl2	CHCl=CHCl		2
64	Difluoroethylene	C2H2F2	CH ₂ =CF ₂	G-1132A, Vinylidenefluoride	1
156	Tetrafluoroethane	C2H2F4	CH ₂ FCF ₃	R-134A, F-134A	2
56	Vinyl Bromide	C2H3Br	CH ₂ =CHBr		1
55	Vinyl Chloride	C2H3Cl	CH ₂ =CHCl	Chloroethylene	1
112	Trichloroethane	C2H3Cl3	CH ₃ CCl ₃	TCA, Methylchloroform	2
103	Difluorochloroethane	C2H3ClF2	CF ₂ ClCH ₃	F-142B, R-142B	1
203	Chlorodifluoroethane	C2H3ClF2	CH ₃ -CF ₂ Cl	R-142b	4
51	Vinyl Fluoride	C2H3F	H ₂ C=CHF		1
348	Ethane,1,1,1-Trifluoro	C2H3F3	C ₂ H ₃ F ₃	HFC-143a	3
173	Acetonitrile	C2H3N	CH ₃ CN		2
38	Ethylene	C2H4	CH ₂ =CH ₂	Ethene	1
222	Ethylene Dichloride	C2H4Cl2	ClCH ₂ CH ₂ Cl	1,2 Dichloroethane	2
82	Difluoroethane	C2H4F2	CH ₃ CHF ₂	Ethyldene Fluoride, R-152A	1
45	Ethylene Oxide	C2H4O	C ₂ H ₄ O	Acetaldehyde	1
283	Acetic acid	C2H4O2	CH ₃ COOH	Ethanoic acid; UN 2789;	2
75	Ethyl Chloride	C2H5Cl	C ₂ H ₅ Cl	Chloroethane orEthane, Chloro or Ethyl Chloride	1

Code	Gas Name	Symbol	Formula	Synonym	Ref
221	Ethyl Fluoride	C2H5F	CH ₃ CH ₂ F	Fluoroethane, R-161, FREON-161	2
54	Ethane	C2H6	CH ₃ CH ₃		1
218	Dimethylcadmium	C2H6Cd	(CH ₃) ₂ Cd		2
73	Dimethyl Ether	C2H6O	CH ₃ OCH ₃	Methylether	1
136	Ethanol	C2H6O	CH ₃ CH ₂ OH		2
169	Ethyleneglycol	C2H6O2	HOCH ₂ CH ₂ OH	Ehtanediol, Glycol	2
284	Dimethyl selenide	C2H6Se	C ₂ H ₆ Se	(CH ₃) ₂ Se; Selenium dimethyl; Dimethylselenium	2
212	Dichlorodimethylsilane	C2H6SiCl ₂	(CH ₃) ₂ SiCl ₂		2
220	Dimethyltellurium	C2H6Te	(CH ₃) ₂ Te		2
135	Dimethylzinc	C2H6Zn	(CH ₃) ₂ Zn		3
164	Dimethylaluminum-hydride	C2H7Al	(CH ₃) ₂ AlH	DMAH	13
85	Dimethylamine	C2H7N	(CH ₃) ₂ NH		1
233	Monoethylamine	C2H7N	C ₂ H ₅ NH ₂		2
285	Ethoxy silane	C2H8OSi	C ₂ H ₈ OSi		2
219	Dimethylsilane	C2H8Si	(CH ₃) ₂ SiH ₂		2
137	Halothane	C2HBrClF ₃	BrClHCCF ₃		6
186	2,2 Dichloro1,1,1 Trifluoroethane	C2HCl ₂ F ₃	CHCl ₂ -CF ₃	Freon 123, Suva 123	2
204	Chlorodifluoroethylene	C2HClF ₂	CF ₂ =CHCl	R-1122, FREON-1122	4
223	Fluoroacetylene	C2HF	FC≡CH		2
155	Pentafluoroethane	C2HF ₅	CF ₃ CHF ₂	F-125, R-125	9
59	Cyanogen	C2N ₂	NCCN	Oxalodinitrile	1
138	Hexafluoropropylene	C3F ₆	CF ₃ CF=CF ₂	Perfluoropropylene or Propylene, Perfluoro	1
225	Hexafluoroacetone	C3F ₆ O	(CF ₃) ₂ CO		2
286	Hexafluoropropylene oxide	C3F ₆ O	C ₃ F ₆ O	Hexafluoroepoxypropane	2
128	Perfluoropropane	C3F ₈	CF ₂ (CF ₃) ₂		1
287	Trimethoxy silane	C3H10O ₃ Si	C ₃ H ₁₀ O ₃ Si		2
190	Trimethyl Silane	C3H10Si	(CH ₃) ₃ SiH		2
165	Trimethylaminealane	C3H12AlN	(CH ₃) ₃ NAlH ₃	TMAA	11
267	Hexafluoro Propane	C3H2F ₆	CH ₂ FCF ₂ CF ₃	1,1,1,2,2,3-Hexafluoropropane	2
288	Pentafluoropropanol	C3H3F ₅ O	C ₂ F ₅ CH ₂ OH	Perfluorodihydropropanol, 1,1,1,2,2-Pentafluoropropane	2
276	Acrylonitrile	C3H3N	CH ₂ =CHCN	Acrylon; Propenenitrile	3
66	Allene	C3H4	CH ₂ =C=CH ₂	Propadiene	1
68	Methyl Acetylene	C3H4	CH ₃ C≡CH	Propyne	1
289	Acrylic acid	C3H4O ₂	C ₃ H ₄ O ₂	2-Propenoic acid; CH ₂ =CHCOOH	2
290	Trifluoropropane	C3H5F ₃	C ₃ H ₅ F ₃	1,1,1-Trifluoropropane; CH ₃ CH ₂ CF ₃	2
61	Cyclopropane	C3H6	C ₃ H ₆		1
69	Propylene	C3H6	CH ₃ CH=CH ₂	Propene	1
81	Methyl Vinyl Ether	C3H6O	CH ₃ OCH=CH ₂		1
184	Acetone	C3H6O	CH ₃ COCH ₃		2

Code	Gas Name	Symbol	Formula	Synonym	Ref
291	Ethyl Formate	C3H6O2	HCO ₂ C ₂ H ₅	Ethyl ester formic acid; HC00C2H5	3
292	Methyl acetate	C3H6O2	CH ₃ CO ₂ CH ₃	Methyl ester acetic acid; UN 1231	3
331	Acetaldehyde methoxy	C3H6O2	CH ₃ OCH ₂ CHO		3
332	Acetone, hydroxy	C3H6O2	CH ₃ COCH ₂ OH	Acetol	3
333	Glycol methylene ether	C3H6O2	C ₃ H ₆ O ₂	1,3-Dioxolane	3
334	Propanoic acid	C3H6O2	CH ₃ CH ₂ CO ₂ H	Propionic acid	3
335	Glycidol	C3H6O2	CH ₂ CHCH ₂ OH	1-Propanol, 2,3 epoxy	3
293	Propenamine	C3H7N	C ₃ H ₇ N	Allylamine; Monoallylamine; UN 2334	2
89	Propane	C3H8	CH ₃ CH ₂ CH ₃		1
187	Isopropal Alcohol	C3H8O	(CH ₃) ₂ CHOH	2-Propanol	2
149	Trimethylaluminum	C3H9Al	Al(CH ₃) ₃	TMA, TMAI	4
151	Trimethylarsenic	C3H9As	(CH ₃) ₃ As	Trimethylarsine, TMAs	2
277	Trimethylborane	C3H9B	(CH ₃) ₃ B		2
131	Trimethoxyborine	C3H9BO3	B(OCH ₃) ₃	TMB, Trimethylborate	2
152	Trimethylgallium	C3H9Ga	Ga(CH ₃) ₃	TMGa	4
153	Trimethylindium	C3H9In	(CH ₃) ₃ In	TMIn	3
109	Trimethylamine	C3H9N	(CH ₃) ₃ N	Methylamine	1
294	Trimethyl ester phosphoric acid	C3H9O4P	C ₃ H ₉ O ₄ P	Methyl phosphate; Trimethoxyphosphine oxide	2
132	Trimethylphosphorous	C3H9P	(CH ₃) ₃ P	Trimethylphosphine, TMP	2
133	Trimethylphosphite	C3H9PO3	(CH ₃ O) ₃ P	TMPi, Trimethoxyphosphine	2
150	Trimethylantimony	C3H9Sb	(CH ₃) ₃ Sb	Trimethylstibene	2
295	Heptafluoropropane	C3HF7	C ₃ HF ₇	1,1,1,2,3,3,3-Heptafluoropropane, Freon 227	2
241	Perfluorobutane	C4F10	C ₄ F ₁₀		3
270	Hexafluoro-2-Butyne	C4F6	CF ₃ C≡CCF ₃	Bis(trifluoromethyl)acetylene; Perfluoro-2-butyne	3
296	Hexafluorocyclobutene	C4F6	C ₄ F ₆	Perfluorocyclobutene; 1,2,3,3,4,4-Hexafluorocyclobutene	3
297	Hexafluoro butadiene-1,3	C4F6	CF ₂ =CF-CF=CF ₂	Perfluorobutadiene-1,3;	3
129	Octafluorocyclobutane	C4F8	(CF ₂) ₄	Perfluorocyclobutane or Cyclobutane, Perfluoro	1
236	Octafluorobutane	C4F8	C ₄ F ₈		3
351	Perfluoro (Oxacyclopentane)	C4F8O	C ₄ F ₈ O		3
111	Isobutane	C4H10	(CH ₃) ₂ CHCH ₃	2-Methylpropane or Propane, 2-Methyl	1
117	Butane	C4H10	CH ₃ (CH ₂) ₂ CH ₃		1
271	Butanol-1	C4H10O	CH ₃ CH ₂ CH ₂ CH ₂ OH		3
336	Butanol-2	C4H10O	CH ₃ CH ₂ CH(OH)CH ₃		3
337	Tertiary Butyl Alcohol	C4H10O	(CH ₃) ₃ COH		3
338	Diethyl ether	C4H10O	C ₂ H ₅ OC ₂ H ₅		3
339	Methyl propyl ether	C4H10O	CH ₃ OC ₃ H ₇		3
340	Methyl isopropyl ether	C4H10O	(CH ₃) ₂ CHOCH ₃		3

Code	Gas Name	Symbol	Formula	Synonym	Ref
341	Isobutyl Alcohol	C4H10O	(CH ₃) ₂ CHCH ₂ OH		3
298	Diethyl sulfide	C4H10S	C ₄ H ₁₀ S	UN 2375; Ethyl sulfide;	2
214	Diethylzinc	C4H10Zn	Zn(C ₂ H ₅) ₂		2
161	Tertiarybutylarsine	C4H11As	C(CH ₃) ₃ AsH ₂	TBA	8
213	Diethylamine	C4H11N	(C ₂ H ₅) ₂ NH		2
162	Tertiarybutylphosphine	C4H11P	C(CH ₃) ₃ PH ₂	TBP	8
250	Tetramethylgermanium	C4H12Ge	(CH ₃) ₄ Ge		2
299	Tetramethoxygermanium	C4H12GeO4	(CH ₃ O) ₄ Ge	Ge(OMe)4	2
300	Dimethoxydimethyl silane	C4H12O2Si	(CH ₃ O) ₂ Si(CH ₃) ₂	KBM 22	2
301	Tetramethoxy silane	C4H12O4Si	(CH ₃ O) ₄ Si	Silicic Acid (H ₄ SiO ₄); Tetramethyl ester; Tetramethyl silicate	2
302	Tetramethyl lead	C4H12Pb	(CH ₃) ₄ Pb	(CH ₃) ₄ Pb; Plumbane, tetramethyl;	2
154	Diethylsilane	C4H12Si	(C ₂ H ₅) ₂ SiH ₂		2
251	Tetramethylsilane	C4H12Si	(CH ₃) ₄ Si		2
252	Tetramethyl Tin	C4H12Sn	(CH ₃) ₄ Sn		2
166	Dimethylethylaminealane	C4H14NAI	(CH ₃) ₂ C ₂ H ₅ NAIH ₃	DMEAA	14
158	Tetramethylcyclotetra-siloxane	C4H16Si4O4	(CH ₃) ₄ H ₄ (SiO) ₄	TOMCATS	7
93	Ethyl Acetylene	C4H6	CH ₃ CH ₂ C≡CH		1
100	Butadiene	C4H6	CH ₂ =C=CHCH ₃	Methylallene	1
98	Transbutene	C4H8	CH ₃ CH=CHCH ₃		2
104	Butene	C4H8	CH ₃ CH ₂ CH=CH ₂	1-Butene	1
106	Isobutene	C4H8	(CH ₃) ₂ C=CH ₂	Isobutylene, Methylpropene	2
107	Cisbutene	C4H8	CH ₃ CH=CHCH ₃	Cis-2-Butene	2
207	Cyclobutane	C4H8	C ₄ H ₈	Tetramethylene	2
182	Tetrahydrofuran	C4H8O	C ₄ H ₈ O		2
140	Nickel Carbonyl	C4O4Ni	Ni(CO) ₄		1
266	Octafluorocyclopentene	C5F8	CF ₂ =C(CF ₃)-CF=CF ₂		3
120	Methylbutene	C5H10	CH ₃ CH ₂ CCH ₃ =CH ₂	2-Methyl-1-Butene	1
122	Dimethylpropane	CSH12	(CH ₃) ₄ C	Neopentane	2
231	Isopentane	C5H12	CH ₃ CH ₂ CH(CH ₃) ₂	2-Methylbutane	2
240	Pentane	C5H12	CH ₃ (CH ₂) ₃ CH ₃		2
303	Trimethylvinylsilane	C5H12Si	C ₅ H ₁₂ Si	Vinyltrimethylsilane; CH ₂ =CHSi(CH ₃) ₃	2
272	Hexafluoro Acetylacetone	C5H2F6O2	C ₅ H ₂ F ₆ O ₂		1
304	Pyridine	C5H5N	C ₅ H ₅ N	Azabenzene; Azine	2
305	Methyl methacrylate polymer	C5H8O2	C ₅ H ₈ O ₂	Poly(methyl methacrylate); 2-Methyl-1-2-propenoic acid	2
230	Iron Carbonyl	C5O5Fe	Fe(CO) ₅		2
192	Hexafluorobenzene	C6F6	C ₆ F ₆		2
178	4-Methyl, 1-Pentene	C6H12	(CH ₃) ₂ CHCH ₂ CH=CH ₂		2
127	Hexane	C6H14	CH ₃ (CH ₂) ₄ CH ₃		2
170	Hexanediol-1,6	C6H14O2	HO(CH ₂) ₆ OH	Hexyleneglycol, Hexamethyleneglycol	2
257	Triethylaluminum	C6H15Al	(C ₂ H ₅) ₃ Al		2

Code	Gas Name	Symbol	Formula	Synonym	Ref
306	Triethyl arsine	C6H15As	(C ₂ H ₅) ₃ As	Arsine; Triethylarsenic	2
307	Triethoxy arsine	C6H15AsO ₃	(C ₂ H ₅ O) ₃ As	Triethyl ester arsenous acid; Triethyl arsenite	2
308	Triethoxyborane	C6H15BO ₃	(C ₂ H ₅ O) ₃ B	Boron triethoxide;	2
148	Triethylgallium	C6H15Ga	(C ₂ H ₅) ₃ Ga	TEGa	4
309	Triethylindium	C6H15In	(C ₂ H ₅) ₃ In	Indium triethyl	2
310	Triethylamine	C6H15N	(C ₂ H ₅) ₃ N	UN 1296; Ethanamine;	2
163	Triethylborate	C6H15O ₃ B	B(OC ₂ H ₅) ₃	TEB, Triethoxyborane	2
311	Triethoxyphosphine	C6H15O ₃ P	(C ₂ H ₅ O) ₃ P	Triethyl phosphite; UN 2323; Phosphorous acid, triethyl ester	2
274	TEAsat	C6H15O ₄ As	(C ₂ H ₅ O) ₃ AsO		1
224	Fluorotriethoxysilane	C6H15OSiF	(C ₂ H ₅ O) ₃ SiF		2
258	Triethylantimony	C6H15Sb	(C ₂ H ₅) ₃ Sb		2
188	Diethoxy Dimethyl Silane	C6H16O ₂ Si	(C ₂ H ₅ O) ₂ Si(CH ₃) ₂		2
312	Triethoxy silane	C6H16O ₃ Si	(C ₂ H ₅ O) ₃ SiH		2
313	Triethyl silane	C6H16Si	(C ₂ H ₅) ₃ SiH	(C ₂ H ₅) ₃ SiH;	2
139	Hexamethyldisilane	C6H18Si ₂	(CH ₃) ₃ Si ₂ (CH ₃) ₃	HMDSi, HMDS	3
228	Hexamethyldisiloxane	C6H18Si ₂ O	(CH ₃) ₆ Si ₂ O		2
227	Hexamethyldisilazane	C6H19Si ₂ N	(CH ₃) ₆ Si ₂ NH		2
172	Chlorobenzene	C6H ₅ Cl	C ₆ H ₅ Cl	Chlorobenzol, Phenylchloride	2
197	Benzene	C6H ₆	C ₆ H ₆		2
180	Phenol	C6H ₆ O	C ₆ H ₅ OH		2
314	Trimethylisoxazole	C6H ₉ NO	CH ₃ CH=CHCH=CHCONH ₂	3,4,5-Trimethylisoxazole, Sorbamide	3
273	Tungsten Hexacarbonyl	C6O ₆ W	W(CO) ₆		1
177	Methylcyclohexane	C7H ₁₄	CH ₃ C ₆ H ₁₁	Hexahydrotoluene	2
181	Toluene	C7H ₈	C ₆ H ₅ CH ₃	Methylbenzene	2
174	Ethylbenzene	C8H ₁₀	C ₆ H ₅ C ₂ H ₅		2
179	o-Xylene	C8H ₁₀	1,2-(CH ₃) ₂ C ₆ H ₄	1,2-Dimethylbenzene	2
263	Xylene m-	C8H ₁₀	1,3-(CH ₃) ₂ C ₆ H ₄	1,3 Dimethyl Benzene	3
264	Xylene p-	C8H ₁₀	1,4-(CH ₃) ₂ C ₆ H ₄	1,4 Dimethyl Benzene	3
342	3-one-2,5-dimethyl hexadiene	C8H ₁₀	CH ₂ =C(CH ₃)C=C(CH ₃)C _H ₂		3
343	1,7-Octadiyne	C8H ₁₀	HC=C(CH ₂) ₄ C≡CH		3
344	2,6-Octadiyne	C8H ₁₀	CH ₃ C≡CCH ₂ CH ₂ C≡CCH ₃		3
345	1,3,5,7-Octatetraene	C8H ₁₀	CH ₂ =CHCH=CHCH=CHC _H =CH ₂		3
237	Octane	C8H ₁₈	CH ₃ (CH ₂) ₆ CH ₃		2
315	Tetraethylgermane	C8H ₂₀ Ge	(C ₂ H ₅) ₄ Ge	(C ₂ H ₅) ₄ Ge; Germanium tetraethyl	2
144	Tetraethoxysilane	C8H ₂₀ O ₄ Si	(C ₂ H ₅ O) ₄ Si	TEOS	2
316	Tetraethyl lead	C8H ₂₀ Pb	(C ₂ H ₅) ₄ Pb	Plumbane, tetraethyl; UN 1649	2
317	Tetraethyl silane	C8H ₂₀ Si	C ₈ H ₂₀ Si	Tetraethylsilane; Tetraethylsilicon; (C ₂ H ₅) ₄ Si	2
318	Tetrakis(dimethylamino)-titanium	C8H ₂₄ N ₄ Ti	C ₈ H ₂₄ N ₄ Ti		2
319	Styrene	C8H ₈	C ₈ H ₈	Ethenylbenzene; Un 2055	2

Code	Gas Name	Symbol	Formula	Synonym	Ref
320	Triallylamine	C9H15N	C ₉ H ₁₅ N		2
209	Dibromodifluoromethane	CBr2F2	Br ₂ CF ₂	R-12B2, FREON-12B2	2
200	Carbon Tetrabromide	CBr4	CB _r ₄		2
199	Bromo-chlorodifluoromethane	CBrClF2	BrClF ₂		2
80	Bromotrifluoromethane	CBrF3	BrCF ₃	F-13B1, R-13B1	1
84	Dichlorodifluoromethane	CCl2F2	CCl ₂ F ₂	F-12, R-12	1
60	Phosgene	CCl2O	CCl ₂ O	Carbonyl Chloride	1
91	Trichlorofluoromethane	CCl3F	CCl ₃ F	F-11, R-11	1
101	Carbon Tetrachloride	CCl4	CCl ₄	Tetrachloromethane or Methane, Tetrachloro	2
74	Chlorotrifluoromethane	CClF3	ClCF ₃	F-13, R-13	1
46	Carbonyl Fluoride	CF2O	CF ₂ O		1
259	Trifluoroacetic Acid	CF3CO2H	CF ₃ CO ₂ H		2
63	Carbon Tetrafluoride	CF4	CF ₄	Tetrafluoromethane or Methane, Tetrafluoro	1
321	Trifluoromethylhypofluorite	CF4O	CF ₄ O	CF3OF; Hypofluorous acid; trifluoromethyl ester	2
268	Methylene Bromide	CH2Br2	CH ₂ Br ₂	UN 2664; Methyl dibromide, Dibromomethane	1
265	Dichloromethane	CH2Cl2	CH ₂ Cl ₂		
160	Difluoromethane	CH2F2	CH ₂ F ₂	Methylene Fluoride	2
208	Diazomethane	CH2N2	CH ₂ N ₂	Acomethylene	2
322	Formaldehyde	CH2O	CH ₂ O	H2C0; UN 1198; BFV	2
44	Methyl Bromide	CH3Br	CH ₃ Br	Bromomethane or Methane, Bromo	1
36	Methyl Chloride	CH3Cl	CH ₃ Cl	Chloromethane or Methane, Chlоро	1
183	Methyltrichlorosilane	CH3Cl3Si	CH ₃ SiCl ₃	MTS	2
33	Methyl Fluoride	CH3F	CH ₃ F	Fluoromethane or Methane, Fluoro	1
323	Iodomethane	CH3I	CH ₃ I	Methyl iodide; Un 2644	2
235	Nitromethane	CH3NO2	CH ₃ NO ₂		2
28	Methane	CH4	CH ₄		1
176	Methanol	CH4O	CH ₃ OH	Methyl Alcohol	2
47	Methyl Mercaptan	CH4S	CH ₃ SH		1
52	Methylamine	CH5N	CH ₃ NH ₂	Amino Methane, Monomethylamine	2
234	Monomethyl hydrazine	CH6N2	CH ₃ N ₂ H ₃		2
185	Methylsilane	CH6Si	CH ₃ SiH ₃	Monomethylsilane	2
83	Tribromomethane	CHBr3	CHBr ₃		2
65	Dichlorodifluoromethane	CHCl2F	CHCl ₂ F	F-21, R-21	1
71	Chloroform	CHCl3	CHCl ₃	Trichloromethane or Methane, Trichloro	2
57	Chlorodifluoromethane	CHClF2	CCIHF ₂	F-22, R-22	1
49	Fluoroform	CHF3	CHF ₃	Trifluoromethane or Methane, Trifluoro, F-23, R-23	1
19	Chlorine	Cl2	Cl ₂		1

Code	Gas Name	Symbol	Formula	Synonym	Ref
37	Cyanogen Chloride	ClCN	ClCN		1
77	Chlorine Trifluoride	ClF3	ClF ₃		1
202	Chlorine Pentafluoride	ClF5	ClF ₅		2
201	Chlorine Dioxide	ClO2	ClO ₂		2
72	Perchloryl Fluoride	ClO3F	ClO ₃ F		1
9	Carbon Monoxide	CO	CO		1
25	Carbon Dioxide	CO2	CO ₂		1
34	Carbonyl Sulfide	COS	COS		1
40	Carbon Disulfide	CS2	CS ₂		2
14	Deuterium	D2	H ₂ ²	D2	2
18	Fluorine	F2	F ₂		1
217	Digermane	Ge2H6	Ge ₂ H ₆		2
113	Germanium Tetrachloride	GeCl4	GeCl ₄	Tetrachlorogermane	2
99	Germanium Tetrafluoride	GeF4	GeF ₄	Tetrafluorogermane	2
43	Germane	GeH4	GeH ₄		1
7	Hydrogen	H2	H ₂		1
20	Water Vapor	H2O	H ₂ O		2
22	Hydrogen Sulfide	H2S	H ₂ S		1
23	Hydrogen Selenide	H2Se	H ₂ Se		1
171	Sulfuric Acid	H2SO4	H ₂ SO ₄		2
229	Hydrogen telluride	H2Te	H ₂ Te		2
10	Hydrogen Bromide	HBr	HBr		1
11	Hydrogen Chloride	HCl	HCl		1
24	Hydrogen Cyanide	HCN	HCN		1
1	Helium	He	He		1
12	Hydrogen Fluoride	HF	HF		1
275	Hafnium Tetranitrate	HfN4O12	Hf(NO ₃) ₄		1
329	Mercury	Hg	Hg	UN 2809	2
17	Hydrogen Iodide	HI	HI		1
269	Hydrazoic Acid	HN3	HN ₃		1
167	Nitric Acid	HNO3	HNO ₃		2
115	Iodine Pentafluoride	IF5	IF ₅		1
5	Krypton	Kr	Kr		1
124	Molybdenum Hexafluoride	MoF6	MoF ₆		2
13	Nitrogen	N2	N ₂		1
157	Tetrafluorohydrazine	N2F4	F ₂ NNF ₂	Dinitrogen Tetrafluoride	1
50	Hydrazine	N2H4	H ₂ NNH ₂		2
27	Nitrous Oxide	N2O	N ₂ O		1
78	Nitrogen Trioxide	N2O3	N ₂ O ₃		1
95	Nitrogen Tetroxide	N2O4	N ₂ O ₄	Dinitrogenoxide	2
346	Niobium Pentachloride	NbCl5	NbCl ₅		3
350	Deuterium Ammonia	ND3	ND ₃		3
2	Neon	Ne	Ne		1
232	Difluoroamidogen	NF2	NF ₂		2

Code	Gas Name	Symbol	Formula	Synonym	Ref
53	Nitrogen Trifluoride	NF ₃	NF ₃		1
29	Ammonia	NH ₃	NH ₃		1
16	Nitric Oxide	NO	NO		2
26	Nitrogen Dioxide	NO ₂	NO ₂		1
141	Nitrosyl Chloride	NOCl	NOCl		1
15	Oxygen	O ₂	O ₂		1
30	Ozone	O ₃	O ₃		1
238	Oxygen Dichloride	OCl ₂	OCl ₂		2
41	Oxygen Difluoride	OF ₂	OF ₂		1
193	Phosphorus Trichloride	PCl ₃	PCl ₃		2
62	Phosphorus Trifluoride	PF ₃	PF ₃		1
143	Phosphorus Pentafluoride	PF ₅	PF ₅		1
31	Phosphine	PH ₃	PH ₃		1
102	Phosphorous Oxychloride	POCl ₃	POCl ₃		2
243	Rhenium Hexafluoride	ReF ₆	ReF ₆		2
3	Radon	Rn	Rn		2
189	Sulfur Monochloride	S ₂ Cl ₂	S ₂ Cl ₂		2
255	Tribromostibine	SbBr ₃	SbBr ₃		2
256	Trichlorostibine	SbCl ₃	SbCl ₃		2
245	Stibine	SbH ₃	SbH ₃		2
349	Diselenium Dichloride	Se ₂ Cl ₂	Se ₂ Cl ₂		3
325	Selenium hexafluoride	SeF ₆	SeF ₆	UN 2194; Selenium fluoride	2
86	Sulfur Tetrafluoride	SF ₄	SF ₄		1
110	Sulfur Hexafluoride	SF ₆	SF ₆		1
347	Disilabutane	Si ₂ C ₂ H ₁₀	Si ₂ C ₂ H ₁₀		3
97	Disilane	Si ₂ H ₆	Si ₂ H ₆		2
328	Trisilane	Si ₃ H ₈	Si ₃ H ₈	Silicopropane; Trisilicane; H ₈ Si ₃	2
253	Tetrasilane	Si ₄ H ₁₀	Si ₄ H ₁₀		2
108	Silicon Tetrachloride	SiCl ₄	SiCl ₄	Tetrachlorosilane	2
244	Deuteriumsilane	SiD ₄	SiH ₂ ⁴		2
88	Silicon Tetrafluoride	SiF ₄	SiF ₄		1
326	Disilane hexafluoride	SiF ₆	SiF ₆	F ₆ Si ₂ ; Hexafluorodisilane	2
67	Dichlorosilane	SiH ₂ Cl ₂	SiH ₂ Cl ₂		1
134	Difluorosilane	SiH ₂ F ₂	SiH ₂ F ₂		10
205	Chlorosilane	SiH ₃ Cl	SiH ₃ Cl		2
327	Fluoro silane	SiH ₃ F	SiH ₃ F	H ₃ FSi	2
39	Silane	SiH ₄	SiH ₄		1
147	Trichlorosilane	SiHCl ₃	SiHCl ₃		5
261	Trifluorosilane	SiHF ₃	SiHF ₃		2
145	Tin Tetrachloride	SnCl ₄	SnCl ₄	Tetrachlorostannane	2
32	Sulfur Dioxide	SO ₂	SO ₂		1
87	Sulfuryl Fluoride	SO ₂ F ₂	SO ₂ F ₂		1
246	Sulfur Trioxide	SO ₃	SO ₃		2
159	Tritium	T ₂	H ₃ ²	T ₂	2

Code	Gas Name	Symbol	Formula	Synonym	Ref
247	Tellurium Hexafluoride	TeF ₆	TeF ₆		2
114	Titanium Tetrachloride	TiCl ₄	TiCl ₄		2
254	Titanium Tetraiodide	TiI ₄	TiI ₄		2
123	Uranium Hexafluoride	UF ₆	UF ₆		2
121	Tungsten Hexafluoride	WF ₆	WF ₆		2
6	Xenon	Xe	Xe		1
324	Xenon difluoride	XeF ₂	XeF ₂	F ₂ Xe; Xenon fluoride	2
330	Zinc	Zn	Zn	UN 1383	2
90	Intentionally Left Blank				
92	Intentionally Left Blank				
175	Intentionally Left Blank				

9 Mixed Gas Table Sorted by Code

Table 4 Mixed Gases Sorted by Code

MIXED GAS NAME	SYMBOL	CODE
15%PHOSPHINE/NITROGEN	15%PH3/N2	0500
5%PHOSPHINE/NITROGEN	5%PH3/N2	0501
20%SILANE/NITROGEN	20%SiH4/N2	0502
40%ARGON/TUNGSTEN HEXAFLUORIDE	40%Ar/WF6	0503
10%ARSINE/HYDROGEN	10%AsH3/H2	0504
40%OXYGEN/HEXAFLUOROETHANE(FREON-116)	40%O2/C2F6	0505
2%TRICHLOROETHANE/NITROGEN	2%C2H3Cl3/N2	0506
20%CARBON DIOXIDE/HYDROGEN	20%CO2/H2	0507
30%CARBON DIOXIDE/AIR	30%CO2/Air	0508
10%GERMANE/HYDROGEN	10%GeH4/H2	0509
5%HYDROGEN SELENIDE/HYDROGEN	5%H2Se/H2	0510
10%HYDROGEN SELENIDE/HYDROGEN	10%H2Se/H2	0511
13%HYDROGEN CHLORIDE/1.32%XENON/NEON	13%HCl/1.32%Xe/Ne	0512
20%OXYGEN/CARBON TETRAFLUORIDE(FREON-14)	20%O2/CF4	0513
1%PHOSPHINE/NITROGEN	1%PH3/N2	0514
1.6%PHOSPHINE/21%SILANE/ARGON	1.6%PH3/21%SiH4/Ar	0515
10%PHOSPHINE/HYDROGEN	10%PH3/H2	0516
25%PHOSPHINE/SILANE	25%PH3/SiH4	0517
50%PHOSPHINE/NITROGEN	50%PH3/N2	0518
15%SILANE/NITROGEN	15%SiH4/N2	0519
21%SILANE/4%PHOSPHINE/ARGON	21%SiH4/4%PH3/Ar	0520
50%SILANE/HELIUM	50%SiH4/He	0521
20%TRICHLOROSILANE/HYDROGEN	20%SiHCl3/H2	0522
5%TETRAETHYLORTHOSILICATE(TEOS)/NITROGEN	5%Si(C ₂ H ₅ O) ₄ /N2	0523
5%TRIETHYLANTIMONY(TESb)/HYDROGEN	5%(C ₂ H ₅) ₃ Sb/H2	0524
20%TRIMETHYLALUMINUM(TMAI)/HYDROGEN	20%(CH ₃) ₃ Al/H2	0525
1%TRIMETHYLBORATE(TMB)/HYDROGEN	1%(CH ₃ O) ₃ B/H2	0526
10%PHOSPHINE/NITROGEN	10%PH3/N2	0527

MIXED GAS NAME	SYMBOL	CODE
4.5%PHOSPHINE/NITROGEN	4.5%PH3/N2	0528
20%SILANE/HELIUM	20%SiH4/He	0529
20%PHOSPHINE/SILANE	20%PH3/SiH4	0530
1%PHOSPHINE/SILANE	1%PH3/SiH4	0531
10%HYDROGEN/NITROGEN	10%H2/N2	0532
1.5%PHOSPHINE/SILANE	1.5%PH3/SiH4	0533
3%PHOSPHINE/ARGON	3%PH3/Ar	0534
4%PHOSPHINE/NITROGEN	4%PH3/N2	0535
20%OXYGEN/HELIUM	20%O2/He	0536
1%PHOSPHINE/ARGON	1%PH3/Ar	0537
10%PHOSPHINE/ARGON	10%PH3/Ar	0538
2%PHOSPHINE/ARGON	2%PH3/Ar	0539
20%ARGON/SILANE	20%Ar/SiH4	0540
20%SILANE/ARGON	20%SiH4/Ar	0541
5%HYDROGEN/NITROGEN	5%H2/N2	0542
16%CARBON DIOXIDE/NITROGEN	16%CO2/N2	0543
2%SILANE/HYDROGEN	2%SiH4/H2	0544
15%HYDROGEN/NITROGEN	15%H2/N2	0545
1%PHOSPHINE/HELIUM	1%PH3/He	0546
.01%DIBORANE/HYDROGEN	.01%B2H6/H2	0547
.01%SILANE/HYDROGEN	.01%SiH4/H2	0548
.5%DIBORANE/ARGON	.5%B2H6/Ar	0549
.5%PHOSPHINE/NITROGEN	.5%PH3/N2	0550
.5%SILANE/HYDROGEN	.5%SiH4/H2	0551
.8%PHOSPHINE/NITROGEN	.8%PH3/N2	0552
.8%PHOSPHINE/SILANE	.8%PH3/SiH4	0553
.9%ARSINE/HYDROGEN	.9%AsH3/H2	0554
1%ARSINE/NITROGEN	1%AsH3/N2	0555
1%ARSINE/SILANE	1%AsH3/SiH4	0556
1%DIBORANE/HYDROGEN	1%B2H6/H2	0557
1%DIBORANE/NITROGEN	1%B2H6/N2	0558
1%BORON TRICHLORIDE/HYDROGEN	1%BCl3/H2	0559
1%BORON TRICHLORIDE/NITROGEN	1%BCl3/N2	0560
1%HYDROGEN/NITROGEN	1%H2/N2	0561
1%OXYGEN/NITROGEN	1%O2/N2	0562
1%PHOSPHINE/HYDROGEN	1%PH3/H2	0563
1.5%ARSINE/HYDROGEN	1.5%AsH3/H2	0564
10%SILANE/ARGON	10%SiH4/Ar	0565
10%FLUORINE/HELIUM	10%F2/He	0566
5%WATER VAPOR/AIR	5%H2O/Air	0567
10%WATER VAPOR/NITROGEN	10%H2O/N2	0568
2%OZONE/OXYGEN	2%O3/O2	0569
10%NITROGEN TRIFLUORIDE/OXYGEN	10%NF3/O2	0570
10%OZONE/OXYGEN	10%O3/O2	0571
10%PHOSPHINE/SILANE	10%PH3/SiH4	0572

MIXED GAS NAME	SYMBOL	CODE
10%SILANE/HELUM	10%SiH4/He	0573
8%CARBON TETRAFLUORIDE(FREON-14)/OXYGEN	8%CF4/O2	0574
10%SILANE/HYDROGEN	10%SiH4/H2	0575
10%NITROGEN/ARGON	10%N2/Ar	0576
20%SILANE/HYDROGEN	20%SiH4/H2	0577
15%ARGON/PHOSPHINE	15%Ar/PH3	0578
15%ARSINE/HYDROGEN	15%AsH3/H2	0579
15%DIBORANE/NITROGEN	15%B2H6/N2	0580
15%PHOSPHINE/15%SILANE/NITROGEN	15%PH3/15%SiH4/N2	0581
15%PHOSPHINE/ARGON	15%PH3/Ar	0582
15%PHOSPHINE/HYDROGEN	15%PH3/H2	0583
15%PHOSPHINE/SILANE	15%PH3/SiH4	0584
17%OXYGEN/CARBON TETRAFLUORIDE(FREON-14)	17%O2/CF4	0585
2%ARSINE/NITROGEN	2%AsH3/N2	0586
2%DIBORANE/ARGON	2%B2H6/Ar	0587
2%HYDROGEN/NITROGEN	2%H2/N2	0588
2%SILANE/HELUM	2%SiH4/He	0589
20%ARSINE/HYDROGEN	20%AsH3/H2	0590
20%DIBORANE/SILANE	20%B2H6/SiH4	0591
20%HYDROGEN/CARBON MONOXIDE	20%H2/CO	0592
20%PHOSPHINE/HYDROGEN	20%PH3/H2	0593
21%OXYGEN/NITROGEN	21%O2/N2	0594
3%DIBORANE/NITROGEN	3%B2H6/N2	0595
3%HYDROGEN/HELUM	3%H2/He	0596
3%HYDROGEN/NITROGEN	3%H2/N2	0597
3%OXYGEN/HELUM	3%O2/He	0598
3%OZONE/AIR	3%O3/Air	0599
3%PHOSPHINE/NITROGEN	3%PH3/N2	0600
3%PHOSPHINE/SILANE	3%PH3/SiH4	0601
3%SILANE/HELUM	3%SiH4/He	0602
30%HELUM/OXYGEN	30%He/O2	0603
30%OXYGEN/HELUM	30%O2/He	0604
4%DIBORANE/NITROGEN	4%B2H6/N2	0605
4%HYDROGEN/HELUM	4%H2/He	0606
4%HYDROGEN/NITROGEN	4%H2/N2	0607
4%NITROGEN/HYDROGEN	4%N2/H2	0608
4%OXYGEN/CARBON TETRAFLUORIDE(FREON-14)	4%O2/CF4	0609
4%PHOSPHINE/HELUM	4%PH3/He	0610
4%PHOSPHINE/SILANE	4%PH3/SiH4	0611
40%HELUM/SILANE	40%He/SiH4	0612
8%OXYGEN/CARBON TETRAFLUORIDE(FREON-14)	8%O2/CF4	0613
5%ARSINE/HYDROGEN	5%AsH3/H2	0614
5%DIBORANE/ARGON	5%B2H6/Ar	0615
5%BORON TRICHLORIDE/HYDROGEN	5%BCl3/H2	0616
5%PROPANE/HYDROGEN	5%C3H8/H2	0617

MIXED GAS NAME	SYMBOL	CODE
5%CARBON DIOXIDE/NITROGEN	5%CO2/N2	0618
5%HYDROGEN/ARGON	5%H2/Ar	0619
8%PHOSPHINE/NITROGEN	8%PH3/N2	0620
5%NITROGEN/HYDROGEN	5%N2/H2	0621
5%NITROGEN/PHOSPHINE	5%N2/PH3	0622
5%OXYGEN/ARGON	5%O2/Ar	0623
5%OZONE/OXYGEN	5%O3/O2	0624
5%PHOSPHINE/5%SILANE/NITROGEN	5%PH3/5%SiH4/N2	0625
5%PHOSPHINE/ARGON	5%PH3/Ar	0626
5%PHOSPHINE/SILANE	5%PH3/SiH4	0627
5%DICHLOROSILANE/ARGON	5%SiH2Cl2/Ar	0628
5%SILANE/ARGON	5%SiH4/Ar	0629
50%HELIUM/OXYGEN	50%He/O2	0630
50%NITROGEN/OXYGEN	50%N2/O2	0631
50%PHOSPHINE/SILANE	50%PH3/SiH4	0632
50%SILANE/HYDROGEN	50%SiH4/H2	0633
6.5%DIBORANE/15%SILANE/NITROGEN	6.5%B2H6/15%SiH4/N2	0634
6.5%DIBORANE/HYDROGEN	6.5%B2H6/H2	0635
8%PHOSPHINE/SILANE	8%PH3/SiH4	0636
30%OXYGEN/HYDROGEN	30%O2/H2	0637
25%AMMONIA/HYDROGEN	25%NH3/H2	0638
8%OZONE/OXYGEN	8%O3/O2	0639
2%PHOSPHINE/NITROGEN	2%PH3/N2	0640
15%OZONE/OXYGEN	15%O3/O2	0641
40%OXYGEN/SULFUR HEXAFLUORIDE	40%O2/SF6	0642
13%HYDROGEN/NITROGEN	13%H2/N2	0643
1%HYDROGEN SULFIDE/HYDROGEN	1%H2S/H2	0644
1%HYDROGEN SELENIDE/HYDROGEN	1%H2Se/H2	0645
10%SILANE/NITROGEN	10%SiH4/N2	0646
10%DISILANE/HELUM	10%Si2H6/He	0647
20%DISILANE/HELUM	20%Si2H6/He	0648
10%OXYGEN/HELUM	10%O2/He	0649
50%HYDROGEN BROMIDE/HYDROGEN CHLORIDE	50%HBr/HCl	0650
12%OZONE/OXYGEN	12%O3/O2	0651
15%NITRIC OXIDE/NITROGEN	15%NO/N2	0652
2%SILANE/NITROGEN	2%SiH4/N2	0653
5%DIBORANE/NITROGEN	5%B2H6/N2	0654
.5%BORON TRICHLORIDE/HYDROGEN	.5%BCl3/H2	0655
.5%PHOSPHINE/HYDROGEN	.5%PH3/H2	0656
3%DIBORANE/HYDROGEN	3%B2H6/H2	0657
1%GERMANE/NITROGEN	1%GeH4/N2	0658
3%DIBORANE/5%SILANE/NITROGEN	3%B2H6/5%SiH4/N2	0659
.3%PHOSPHINE/SILANE	.3%PH3/SiH4	0660
30%NITROGEN TRIFLUORIDE/NITROGEN	30%NF3/N2	0661
.8%DIBORANE/NITROGEN	.8%B2H6/N2	0662

MIXED GAS NAME	SYMBOL	CODE
2%ARSINE/SILANE	2%AsH3/SiH4	0663
8%GERMANE/HYDROGEN	8%GeH4/H2	0664
3%ARSINE/HYDROGEN	3%AsH3/H2	0665
10%DIBORANE/NITROGEN	10%B2H6/N2	0666
8%PHOSPHINE/HELIUM	8%PH3/He	0667
10%AMMONIA/NITROGEN	10%NH3/N2	0668
5%FLUORINE/NITROGEN TRIFLUORIDE	5%F2/NF3	0669
10%DISILANE/ARGON	10%Si2H6/Ar	0670
3%PHOSPHINE/5%SILANE/NITROGEN	3%PH3/5%SiH4/N2	0671
3%NITROGEN/HYDROGEN	3%N2/H2	0672
.7%ARSINE/HYDROGEN	.7%AsH3/H2	0673
10%PHOSPHINE/HELIUM	10%PH3/He	0674
.8%PHOSPHINE/HELIUM	.8%PH3/He	0675
7.5%PHOSPHINE/SILANE	7.5%PH3/SiH4	0676
20%FLUORINE/HELIUM	20%F2/He	0677
22%PHOSPHINE/SILANE	22%PH3/SiH4	0678
5%TRICHLOROSILANE/HYDROGEN	5%SiHCl3/H2	0679
25%TRICHLOROSILANE/HYDROGEN	25%SiHCl3/H2	0680
.8%PHOSPHINE/DISILANE	.8%PH3/Si2H6	0681
13%TRICHLOROSILANE/HYDROGEN	13%SiHCl3/H2	0682
5%DIBORANE/SILANE	5%B2H6/SiH4	0683
1%SILANE/DIBORANE	1%SiH4/B2H6	0684
7%METHYLENE CHLORIDE/3%OZONE/AIR	7%CH2Cl2/3%O3/Air	0685
50%FLUOROFORM/ARGON	50%CHF3/Ar	0686
20%HELUM/OXYGEN	20%He/O2	0687
3%ARSINE/ARGON	3%AsH3/Ar	0688
10%METHYLSILANE/HYDROGEN	10%CH6Si/H2	0689
.05%DIBORANE/HYDROGEN	.05%B2H6/H2	0690
4%PHOSPHINE/ARGON	4%PH3/Ar	0691
8%HYDROGEN/ARGON	8%H2/Ar	0692
5%PHOSPHINE/HELIUM	5%PH3/He	0693
15%HYDROGEN/ARGON	15%H2/Ar	0694
2%DIBORANE/NITROGEN	2%B2H6/N2	0695
2%PHOSPHINE/SILANE	2%PH3/SiH4	0696
15%DIBORANE/ARGON	15%B2H6/Ar	0697
10%GERMANE/ARGON	10%GeH4/Ar	0698
5%METHANE/HELIUM	5%CH4/He	0699
4%HYDROGEN/ARGON	4%H2/Ar	0700
10%DIBORANE/HYDROGEN	10%B2H6/H2	0701
40%SILANE/HELIUM	40%SiH4/He	0702
2%ARSINE/HYDROGEN	2%AsH3/H2	0703
10%GERMANE/HELIUM	10%GeH4/He	0704
9.4%ARGON/NITROGEN TRIFLUORIDE	9.4%Ar/NF3	0705
8.6%ARGON/NITROGEN TRIFLUORIDE	8.6%Ar/NF3	0706
.8%PHOSPHINE/HYDROGEN	.8%PH3/H2	0707

MIXED GAS NAME	SYMBOL	CODE
.06%ARSINE/HYDROGEN	.06%AsH3/H2	0708
5%PHOSPHINE/HYDROGEN	5%PH3/H2	0709
10%METHANE/ARGON	10%CH4/Ar	0710
5%ACETONE/NITROGEN	5%C3H6O-m)/N2	0711
5%BENZENE/NITROGEN	5%C6H6/N2	0712
20%DISILANE/HYDROGEN	20%Si2H6/H2	0713
8%PROPANE/10%AMMONIA/AIR	8%C3H8/10%NH3/Air	0714
8.2%PROPANE/9.8%AMMONIA/AIR	8.2%C3H8/9.8%NH3/Air	0715
10%CYCLOPROPANE/HELUM	10%C3H6-a)/He	0716
2%METHYSILANE/HYDROGEN	2%CH6Si/H2	0717
10%ETHYLENE/HELUM	10%C2H4/He	0718
5%CHLORINE/HELUM	5%Cl2/He	0719
5%FLUORINE/HELUM	5%F2/He	0720
.7%ARSINE/HELUM	.7%AsH3/He	0721
5%DIBORANE/HYDROGEN	5%B2H6/H2	0722
20%OZONE/NITROGEN	20%O3/N2	0723
1%ARSINE/HYDROGEN	1%AsH3/H2	0724
40%HYDROGEN/HELUM	40%H2/He	0725
5%HYDROGEN CHLORIDE/NITROGEN	5%HCl/N2	0726
8%HYDROGEN/NITROGEN	8%H2/N2	0727
20%CARBON TETRAFLUORIDE/NITROGEN	20%CF4/N2	0728
10%CARBON MONOXIDE/CARBON DIOXIDE	10%CO/CO2	0729
10%CARBON MONOXIDE/AIR	10%CO/Air	0730
10%DISILANE/HYDROGEN	10%Si2H6/H2	0731
5%FLUORINE/NITROGEN	5%F2/N2	0732
1%FLUORINE/NEON	1%F2/Ne	0733
5%CARBON DIOXIDE/15%OXYGEN/NITROGEN	5%CO2/15%O2/N2	0734
10%CARBON DIOXIDE/10%OXYGEN/NITROGEN	10%CO2/10%O2/N2	0735
20%OXYGEN/NITROGEN	20%O2/N2	0736
25%HELUM/ARGON	25%He/Ar	0737
4%HELUM/NITROGEN	4%He/N2	0738
10%TRIMETHYSILANE/HYDROGEN	10%(CH3)3SiH/H2	0739
2%GERMANE/ARGON	2%GeH4/Ar	0740
.8%ARSINE/HYDROGEN	.8%AsH3/H2	0741
.8%GERMANIUM TETRAFLUORIDE/HYDROGEN	.8%GeF4/H2	0742
.8%DIBORANE/HYDROGEN	.8%B2H6/H2	0743
10%METHANE/HELUM	10%CH4/He	0744
1%SILANE/HELUM	1%SiH4/He	0745
25%FLUORINE/NITROGEN	25%F2/N2	0746
50%GERMANE/ARGON	50%GeH4/Ar	0747
7%CARBON DIOXIDE/10%HYDROGEN/20%CARBON MONOXIDE/NITROGEN	7%CO2/10%H2/20%CO/N2	0748
10%HELUM/HYDROGEN	10%He/H2	0749
1%BUTADIENE/BUTENE	1%C4H6-e)/C4H8-i)	0750
40%GERMANE/ARGON	40%GeH4/Ar	0751

MIXED GAS NAME	SYMBOL	CODE
5%HELIUM/NITROGEN	5%He/N2	0752
5%OXYGEN/CARBON TETRAFLUORIDE	5%O2/CF4	0753
10%FLUORINE/ARGON	10%F2/Ar	0754
25%FLUORINE/ARGON	25%F2/Ar	0755
50%FLUORINE/ARGON	50%F2/Ar	0756
50%FLUORINE/HELIUM	50%F2/He	0757
25%FLUORINE/HELIUM	25%F2/He	0758
10%FLUORINE/NITROGEN	10%F2/N2	0759
50%FLUORINE/NITROGEN	50%F2/N2	0760
5%FLUORINE/ARGON	5%F2/Ar	0761
5%HYDROGEN/HELIUM	5%H2/He	0762
5%SULFUR DIOXIDE/HELIUM	5%SO2/He	0763
2%DISILANE/HELIUM	2%Si2H6/He	0764
5%GERMANE/HELIUM	5%GeH4/He	0765
5%DIBORANE/HELIUM	5%B2H6/He	0766
20%PHOSPHINE/NITROGEN	20%PH3/N2	0767
3.5%HYDROGEN/NITROGEN	3.5%H2/N2	0768
50%HEXAFLUOROETHANE/OXYGEN	50%C2F6/O2	0769
25%HEXAFLUOROETHANE/OXYGEN	25%C2F6/O2	0770
.7%GERMANIUM/HYDROGEN	.7%GeH4/H2	0771
1%ACETYLENE/ETHYLENE	1%C2H2/C2H4	0772
5%SILANE/NITROGEN	5%SiH4/N2	0773
.8%CO/.8%O2/20%CO2/32%N2/H2	SELOX GAS MIX	0774
1.5%GERMANE/HYDROGEN	1.5%GeH4/H2	0775
5%BORON TRIFLUORIDE/HELIUM	5%BF3/He	0776
5%PHOSPHORUS PENTAFLUORIDE/HELIUM	5%PF5/He	0777
15%CARBON DIOXIDE/NITROGEN	15%CO2/N2	0778
5%OXYGEN/HELIUM	5%O2/He	0779
5%SILANE/HELIUM	5%SiH4/He	0780
1%NITROGEN DIOXIDE/NITROGEN	1%NO2/N2	0781
1%SULFUR DIOXIDE/NITROGEN	1%SO2/N2	0782
10%CARBON DIOXIDE/NITROGEN	10%CO2/N2	0783
.02%CARBON MONOXIDE/NITROGEN	.02%CO/N2	0784
5%HEXAFLUOROETHANE/OXYGEN	5%C2F6/O2	0785
.1%CARBON MONOXIDE/NITROGEN	.1%CO/N2	0786
15%GERMANIUM TETRACHLORIDE/OXYGEN	15%GeCl4/O2	0787
2%NITROGEN/3%CARBON MONOXIDE/17%CARBON DIOXIDE/HYDROGEN	2%N2/3%CO/17%CO2/H2	0788
.1%PHOSPHINE/NITROGEN	.1%PH3/N2	0789
.1%HYDROGEN CHLORIDE/NITROGEN	.1%HCl/N2	0790
.1%NITROGEN DIOXIDE/AIR	.1%NO2/Air	0791
.1%NITROGEN DIOXIDE/NITROGEN	.1%NO2/N2	0792
.1%PHOSPHINE/HYDROGEN	.1%PH3/H2	0793
.2%SULFUR DIOXIDE/AIR	.2%SO2/Air	0794
.25%CARBON MONOXIDE/.1% HYDROGEN/1%OXYGEN/NITROGEN	.25%CO/.1%H2/1%O2/N2	0795

MIXED GAS NAME	SYMBOL	CODE
.25%DIBORANE/HYDROGEN	.25%B2H6/H2	0796
.25%OXYGEN/.5%HYDROGEN/1.5%CARBON MONOXIDE/NITROGEN	.25%O2/.5%H2/1.5%CO/N2	0797
.4%HYDROGEN CHLORIDE/AIR	.4%HCl/Air	0798
.5%ARSINE/SILANE	.5%AsH3/SiH4	0799
1%CARBON DIOXIDE/NITROGEN	1%CO2/N2	0800
1%CARBON MONOXIDE/19% NITROGEN/30%OXYGEN/CARBON DIOXIDE	1%CO/19%N2/30%O2/CO2	0801
1%CARBON MONOXIDE/AIR	1%CO/Air	0802
1%CARBON MONOXIDE/CARBON DIOXIDE	1%CO/CO2	0803
1%CHLORINE/NITROGEN	1%Cl2/N2	0804
1%DIBORANE/ARGON	1%B2H6/Ar	0805
1%HYDROGEN SULFIDE/NITROGEN	1%H2S/N2	0806
1%METHANE/49.5%CARBON DIOXIDE/ARGON	1%CH4/49.5%CO2/Ar	0807
1%NITROGEN DIOXIDE/AIR	1%NO2/Air	0808
1%SULFUR DIOXIDE/ARGON	1%SO2/Ar	0809
1.5%SILANE/ARGON	1.5%SiH4/Ar	0810
1.8%SILANE/NITROGEN	1.8%SiH4/N2	0811
1.9%SILANE/NITROGEN	1.9%SiH4/N2	0812
10%CARBON DIOXIDE/ARGON	10%CO2/Ar	0813
10%FLUORINE/OXYGEN	10%F2/O2	0814
10%METHANE/HYDROGEN	10%CH4/H2	0815
10%OXYGEN/30%CARBON DIOXIDE/ARGON	10%O2/30%CO2/Ar	0816
10%OZONE/NITROGEN	10%O3/N2	0817
10%SULFUR DIOXIDE/NITROGEN	10%SO2/N2	0818
12%HYDROGEN/NITROGEN	12%H2/N2	0819
15%DIBORANE/HYDROGEN	15%B2H6/H2	0820
15%SILANE/ARGON	15%SiH4/Ar	0821
2%NITRIC OXIDE/NITROGEN	2%NO/N2	0822
2%SILANE/ARGON	2%SiH4/Ar	0823
2%SULFUR DIOXIDE/NITROGEN	2%SO2/N2	0824
2.5%DIBORANE/HYDROGEN	2.5%B2H6/H2	0825
2.5%METHANE/AIR	2.5%CH4/Air	0826
20%FLUOROFORM/OXYGEN	20%CF4/O2	0827
22%OXYGEN/HELUM	22%O2/He	0828
25%CARBON MONOXIDE/HYDROGEN	25%CO/H2	0829
25%PROPANE/PROPYLENE	25%C3H8/C3H6	0830
3%AMMONIA/NITROGEN	3%NH3/N2	0831
3%BORON TRICHLORIDE/HYDROGEN	3%BCl3/H2	0832
3%HYDROGEN/ARGON	3%H2/Ar	0833
3%PHOSPHINE/HELUM	3%PH3/He	0834
3.5%CARBON DIOXIDE/HELUM	3.5%CO2/He	0835
30% ISOBUTANE/HELUM	30%CH(CH3)3/He	0836
30%GERMANE/ARGON	30%GeH4/Ar	0837
30%SILANE/ARGON	30%SiH4/Ar	0838
30%SILANE/NITROGEN	30%SiH4/N2	0839

MIXED GAS NAME	SYMBOL	CODE
33.3%HYDROGEN/CARBON MONOXIDE	33.3%H2/CO	0840
35%PHOSPHINE/SILANE	35%PH3/SiH4	0841
4%SILANE/NITROGEN	4%SiH4/N2	0842
5%AMMONIA/NITROGEN	5%NH3/N2	0843
5%CARBON MONOXIDE/ARGON	5%CO/Ar	0844
5%ETHENE/NITROGEN	5%C2H4/N2	0845
5%HELIUM/ARGON	5%He/Ar	0846
5%SILANE/HYDROGEN	5%SiH4/H2	0847
50%CARBON DIOXIDE/NITROGEN	50%CO2/N2	0848
50%HELIUM/ARGON	50%He/Ar	0849
50%HYDROGEN/NITROGEN	50%H2/N2	0850
50%NITROGEN DIOXIDE/AMMONIA	50%NO2/NH3	0851
50%NITROGEN/HELIUM	50%N2/He	0852
50%SULFUR DIOXIDE/NITRIC OXIDE	50%SO2/NO	0853
6%CARBON DIOXIDE/NITROGEN	6%CO2/N2	0854
6%HYDROGEN CHLORIDE/OXYGEN	6%HCl/O2	0855
6%HYDROGEN/NITROGEN	6%H2/N2	0856
6%OZONE/OXYGEN	6%O3/O2	0857
6.5%DIBORANE/NITROGEN	6.5%B2H6/N2	0858
7%HYDROGEN/ARGON	7%H2/Ar	0859
8%DIBORANE/ARGON	8%B2H6/Ar	0860
8%DIBORANE/NITROGEN	8%B2H6/N2	0861
5%CARBON MONOXIDE/NITROGEN	5%CO/N2	0862
2%OXYGEN/ARGON	2%O2/Ar	0863
15%SILANE/HELIUM	15%SiH4/He	0864
5%CARBON DIOXIDE/5%OXYGEN/NITROGEN	5%CO2/5%O2/N2	0865
2.5%OXYGEN/5%CARBON DIOXIDE/NITROGEN	2.5%O2/5%CO2/N2	0866
5%CARBON DIOXIDE/10%OXYGEN/NITROGEN	5%CO2/10%O2/N2	0867
11%OZONE/OXYGEN	11%O3/O2	0868
20%OZONE/OXYGEN	20%O3/O2	0869
3%SILANE/HYDROGEN	3%SiH4/H2	0870
1%NITROGEN/HYDROGEN	1%N2/H2	0871
3%PROPANE/HYDROGEN	3%C3H8/H2	0872
1.65%ACETYLENE/70%ETHYLENE/NITROGEN	1.65%C2H2/70%C2H4/N2	0873
30%TRIMETHYLSILANE/HYDROGEN	30%(CH3)3SiH/H2	0874
20%OXYGEN/ARGON	20%O2/Ar	0875
5%DIBORANE/5%SILANE/NITROGEN	5%B2H6/5%SiH4/N2	0876
30%TRICHLOROSILANE/HYDROGEN	30%SiHCl3/H2	0877
3%ETHYLENE/HELIUM	3%C2H4/He	0878
.1%HYDROGEN/.25%CARBON MONOXIDE/1%OXYGEN/NITROGEN	.1%H2/.25%CO/1%O2/N2	0879
20%NITROGEN/HYDROGEN	20%N2/H2	0880
10%DIBORANE/ARGON	10%B2H6/Ar	0881
21.6%CARBON DIOXIDE/32.4% NITROGEN/HYDROGEN	21.6%CO2/32.4%N2/H2	0882
7%HYDROGEN/HELIUM	7%H2/He	0883
4%TETRAFLUOROETHANE (FREON-	4%C2H2F4/44%C2HF5/C2H3F3	0884