SGD Gas Data & Equipment Recommendations

CATALOG 30

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The following information is provided as a guide to assist you in selecting the correct gas control for use with each of your cylinder gases. The listing is divided into three distinct groups - Pure Gases, Pure Gases in Lecture Bottles, and Two-Component Gas Mixtures.

To use this guide, simply locate the gas or gas mixture you are using within the appropriate group. The tables for Pure Gases and Pure Gases in Lecture Bottles have their information initially arranged alphabetically by the gas of interest, and then secondarily alphabetized by the specific grade of that gas. The information in the Two-Component Gas Mixtures table is listed first alphabetically by minor component and then alphabetically by the balance gas, or major component. For example, 2% Ammonia, 98% Helium would be listed first under Ammonia (the minor component), then under "In Helium" (the balance gas) within the Ammonia grouping.

Across from each individual listing you will find that product's normal corresponding valve outlet connection number (CGA Connection), the recommended regulator model, and a reference page number directing you to the page in our catalog where additional information and complete specifications on that regulator can be found. In the Pure Gas Table you will also find certain physical properties of the gas, such as chemical formula, molecular weight, vapor pressure (liquefied gases), specific gravity and specific volume. In certain cases, where pressure reduction is not desired or required, such as with very low pressure products such as boron trichloride, a manual control valve has been recommended instead of a pressure regulator. Please remember that Manual Control Valves control flow, not pressure.

You should note that the recommendations contained herein are valid, and generally preferred for the more common applications of the products indicated; and consideration has been given to safety, materials compatibility, as well as to convenience and suitability for these common applications. However, the recommendations shown may not be the only models that are suitable, and your specific application may have subtleties that would indicate that a different selection is a more preferable choice. If you need assistance in making your selection, or wish to confirm that your choice is correct, please contact us.

If you are using a product that is not listed within these tables, please do not hesitate to contact us to discuss your requirements.

Pure Gases

Gas Grade	Mol. Weight	Vapor Pressure (psig at 70°F	Specific Gravity (Air=1)	Specific Volume (ft^3/lb. at 70°F)	CGA Connection Number	Equipment Recommendations	Page Number
Acetylene (C_2H_2)	**26.038**	**—**	**0.91 at 32°F**	**14.5**			
Atomic Absorption					510	3101A	6
Commercial Grade, 98.0%					510	3101A	6
Purified					510	3101A	6
Technical					510	3101A	6
Air	**28.975**	**—**	**1.00**	**13.3**			
Blended Air (<99.999)					590	2401 or 2421	24, 25
CO_2 Free					590	3101 or 3201	6, 7
Compressed Air (<99.999)					346	2401 or 2421	24, 25
Dry (<99.999)					346/590*	3101 or 3201	6, 7
High Pressure (3500 psig)					347	3800V or 3860TB	20, 21
High Pressure (6000 psig)					702	3800V or 3860TB	20, 21
Hydrocarbon Free					346/590*	3101 or 3201	6, 7
USP (<99.999)					346/950*	2401 or 2421	24, 25
Ultra Pure Carrier					590	3201	7
Ultra Zero					590	3201	7
Vehicle Emission Zero					590	3201	7
V.O.C. Free Air					590	3201	7
Zero					346/590*	3201	7

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Pure Gases

Gas Grade	Mol. Weight	Vapor Pressure (psig at 70°F	Specific Gravity (Air=1)	Specific Volume (ft^3/lb. at 70°F)	CGA Connection Number	Equipment Recommendations	Page Number
Allene (C_3H_4)	**40.065**	**116.7**	**1.415 at 68°F**	**9.6**			
					510	3103	6
Ammonia (NH_3)	**17.031**	**114.1**	**0.597**	**22.7**			
Anhydrous					705	3403	8
Electronic					660	3403	8
Nitride					660	3403	8
Research					660	3403	8
Semiconductor Purity					660/720*	3403	8
SFC Grade					660	3403	8
ULSI Purity					660/720*	3403	8
Ultra High Purity					660/720*	3403	8
Argon (Ar)	**39.948**	**—**	**1.378**	**9.68**			
Grade 6™					580	3201	7
High Pressure (3500 psig)					680	3800V or 3860TB	20, 21
High Pressure (6000 psig)					677	3800V or 3860TB	20, 21
High Purity					580	3201	7
Oxygen Free					580	3201	7
Prepurified					580	3201	7
Research					580	3201	7
Semiconductor Purity					580	3201	7
Sputtering					580	3201	7
ULSI Purity					580	3201	7
Ultra High Purity					580	3201	7
Ultraplus™					580	3201	7
Ultra Pure Carrier					580	3201	7
Zero					580	3201	7
Arsine (AsH_3)	**77.946**	**205**	**2.69**	**5.0**			
Electronic					350/632*	3403	8
ULSI Purity					350/632*	3403	8
Boron Trichloride (BCl_3)	**117.169**	**4.4**	**4.03**	**3.3**			
CP					660	3472	15
Electronic					660	3472	15
Semiconductor Purity					660/634*	3472	15
VLSI Etchant					660	3472	15
Boron Trifluoride (BF_3)	**67.805**	**—**	**2.387**	**5.7**			
CP					330	3470	15
1,3 Butadiene (C_4H_6)	**54.092**	**21.4**	**1.915 at 60°F**	**6.9**			
CP					510	3103	6
High Purity (Inhibited)					510	3103	6
Instrument					510	3103	6
Research					510	3103	6

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Pure Gases

Gas Grade	Mol. Weight	Vapor Pressure (psig at 70°F	Specific Gravity (Air=1)	Specific Volume (ft³/lb. at 70°F)	CGA Connection Number	Equipment Recommendations	Page Number
Butane (C_4H_{10})	**58.123**	**16.3**	**2.110 at 68°F**	**6.4**			
CP					510	3103	6
Instrument					510	3103	6
Technical					510	3103	6
n-Butane See Butane							
iso-Butane See Isobutane							
1-Butene (C_4H_8)	**56.108**	**23.5**	**1.937**	**6.7**			
CP					510	3103	6
High Purity					510	3103	6
Research					510	3103	6
cis-2-Butene (C_4H_8)	**56.108**	**13**	**1.997 at 68°F**	**6.7**			
High Purity					510	3103	6
Technical					510	3103	6
trans-2-Butene (C_4H_8)	**56.108**	**15**	**1.997 at 68°F**	**6.7**			
High Purity					510	3103	6
Technical					510	3103	6
(cis & trans) 2-Butene (C_4H_8)	**56.108**	**14**	**1.997 at 68°F**	**6.7**			
Technical					510	3103	6
iso-Butylene See Isobutylene							
Carbon Dioxide (CO_2)	**44.011**	**830**	**1.522**	**8.76**			
Anaerobic					320	3101	6
Bone Dry (<99.999)					320	2401	24
CP (<99.999)					320	2401	24
Commercial					320	2401	24
Electronic					320	3101	6
Instrument (Coleman)					320	3101	6
Precision Aquarator®					320	3101	6
Research					320	3101	6
SFC Grade					320	3101	6
SFE					320	3101	6
Spectra-Clean®, Grade 5™					320	3101	6
USP (<99.999)					320/940*	2401	24
Carbon Monoxide (CO)	**28.010**	**—**	**0.968**	**13.8**			
CP					350	2421	25
Commercial					350	2421	25
Research					350	3201	7
Technical (<99.999)					350	3201	7
Ultra High Purity					350	3201	7

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Pure Gases

Gas Grade	Mol. Weight	Vapor Pressure (psig at 70°F	Specific Gravity (Air=1)	Specific Volume (ft³/lb. at 70°F)	CGA Connection Number	Equipment Recommendations	Page Number
Carbon Tetrafluoride							
See Halocarbon 14							
Carbonyl Sulfide (COS)	**60.070**	**160**	**2.10 at 68°F**	**6.4**			
					330	3403	8
Chlorine (Cl_2)	**70.906**	**85.3**	**2.473 at 68°F**	**5.4**			
High Purity					660	3472	15
Research					660	3472	15
Semiconductor Purity					660/728*	3472	15
ULSI Purity					660/728*	3472	15
Ultra High Purity					660/728*	3472	15
Cyclopropane (C_3H_6)	**42.081**	**75.0**	**1.453 at 68°F**	**9.2**			
					510	3103	6
Deuterium (D_2)	**4.032**	**—**	**0.139 at 32°F**	**95.9**			
CP					350	3201	7
Research					350	3201	7
Dichlorosilane (H_2SiCl_2)	**101.010**	**9.1**	**3.52 at 77°F**	**3.83**			
Electronic					678	3403	8
Semiconductor Purity					678/636*	3403	8
ULSI Purity					678/636*	3403	8
Ultraplus™					678/636*	3403	8
Dimethylamine (C_2H_7N)	**45.085**	**11.3**	**1.557 at 77°F**	**8.6**			
					705	3403 or 8520	8, 101
Dimethyl Ether (C_2H_6O)	**46.069**	**62.3**	**1.59**	**8.4**			
					510	3103	6
2,2-Dimethylpropane (C_5H_{12})	**72.151**	**7.0**	**2.49 at 77°F**	**5.3**			
Research					510	3103	6
Ethane (C_2H_6)	**30.07**	**544**	**1.047 at 60°F**	**12.8**			
CP					350	3102	6
Research					350	3102	6
Technical					350	3102	6
Ultra High Purity					350	3102	6
Ethyl Acetylene (C_4H_6)	**54.092**	**8.5**	**1.93 at 77°F**	**7.2**			
					510	3103A	6
Ethyl Chloride (C_2H_5Cl)	**64.515**	**5.3**	**2.22 at 68°F**	**6.0**			
High Purity					300	8520	101
Ethylene (C_2H_4)	**28.054**	**—**	**0.978 at 32°F**	**13.8**			
CP					350	3101	6
Polymer Grade					350	3101	6
Research					350	3101	6
Technical					350	2401	24

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Pure Gases

Gas Grade	Mol. Weight	Vapor Pressure (psig at 70°F	Specific Gravity (Air=1)	Specific Volume (ft³/lb. at 70°F)	CGA Connection Number	Equipment Recommendations	Page Number
Ethylene Oxide (C_2H_4O)	**44.054**	**6.5**	**1.52**	**8.78**			
99.90%					510	8520	101
Halocarbon 12 (CCl_2F_2) (Dichlorodifluoromethane)	**120.914**	**70.2**	**4.26**	**3.14**			
					660	3103	6
Halocarbon 13 ($CClF_3$) (Chlorotrifluoromethane)	**104.459**	**458.7**	**3.70**	**3.61**			
					320/660*	3102	6
Halocarbon 13B1 ($CBrF_3$) (Bromotrifluoromethane)	**148.910**	**189**	**5.30**	**2.6**			
					320/660*	3103	6
Halocarbon 14 (CF_4) (Tetrafluoromethane)	**88.005**	**—**	**3.038**	**4.39**			
Electronic					320/660*	3501	9
Semiconductor Purity					320/580*	3501	9
Ultraplus™					320/660*	3501	9
VLSI					580	3501	9
Halocarbon 21 ($CHCl_2F$) (Dichlorofluoromethane)	**102.923**	**8.4**	**3.82 at 68°F**	**3.5**			
					660	8520	101
Halocarbon 22 ($CHClF_2$) (Chlorodifluoromethane)	**86.469**	**123**	**3.08**	**4.4**			
					660	3103	6
Halocarbon 23 (CHF_3) (Trifluoromethane)	**70.014**	**635**	**2.43**	**5.5**			
Technical					660	3101	6
Ultraplus™					320/660*	3101	6
99.90%					320/660*	2401	24
Halocarbon 114 ($C_2Cl_2F_4$) (1,2-Dichlorotetrafluoroethane)	**170.922**	**12.9**	**5.93 at 77°F**	**2.3**			
					660	3103	6
Halocarbon 115 (C_2ClF_5) (Chloropentafluoroethane)	**154.467**	**102**	**5.569**	**2.4**			
					660	3103	6
Halocarbon 116 (C_2F_6) (Hexafluoroethane)	**138.012**	**430.3**	**4.773**	**2.8**		3102	6
99.90%					320/660*	2401	24
Semiconductor Purity					660	3102	6
Halocarbon 142B ($C_2H_3ClF_2$) (1-Chloro-1,1-Difluoroethane)	**100.496**	**27.8**	**3.63**	**3.68**			
					510	3103	6

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Pure Gases

Gas Grade	Mol. Weight	Vapor Pressure (psig at 70°F	Specific Gravity (Air=1)	Specific Volume (ft³/lb. at 70°F)	CGA Connection Number	Equipment Recommendations	Page Number
Halocarbon 152A ($C_2H_4F_2$) (1,1-Difluoroethane)	**66.051**	**63**	**2.36**	**5.85**			
					510	3103	6
Halocarbon C-318 (C_4F_8) (Octafluorocyclobutane)	**200.031**	**25**	**7.33**	**1.85**			
					660	3103	6
Halocarbon 500 (73.8 wt.% Halocarbon 12 26.2 wt.% Halocarbon 152A)	**100.1**	**82.3**	**3.5**	**3.82**			
					660/510*	3103	6
Halocarbon 502 (48.8 wt.% Halocarbon 22 51.2 wt.% Halocarbon 115)	**111.63**	**132.2**	**3.87**	**3.45**			
					320/660*	3103	6
Halocarbon 503 (60 wt.% Halocarbon 23 40 wt.% Halocarbon 13)	**87.247**	**613**	**3.07**	**4.3**			
					320	2401	24
Halocarbon 1113 (C_2ClF_3) (Chlorotrifluoroethylene)	**116.47**	**62**	**4.13**	**3.30**			
					510	3103	6
Halocarbon 1132A ($C_2H_2F_2$) (1,1-Difluoroethylene)	**64.035**	**518**	**2.21 at 77°F**	**6.0**			
					350	2401	24
Helium (He)	**4.003**	**—**	**0.138**	**96.7**			
Carrier Grade					580	3201	7
Chromatographic					580	3201	7
ECD Grade					580	3201	7
Grade 6™					580	3201	7
High Pressure (3500 psig)					680	3800V or 3860TB	20, 21
High Pressure (6000 psig)					677	3800V or 3860TB	20, 21
High Purity					580	3201	7
Oxygen Free					580	3201	7
Research					580	3201	7
Semiconductor Purity					580	3201 or 3501	7, 9
Ultra High Purity					580	3201	7
Ultraplus™					580	3201	7
Ultra Pure Carrier					580	3201	7
ULSI					580	3201 or 3501	7, 9
USP (<99.999)					580/930*	2421	25
Zero					580	3201	7

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Pure Gases

Gas Grade	Mol. Weight	Vapor Pressure (psig at 70°F	Specific Gravity (Air=1)	Specific Volume (ft³/lb. at 70°F)	CGA Connection Number	Equipment Recommendations	Page Number
Hexafluoropropylene (C_3F_6)	**150.023**	**85**	**5.18 at 68°F**	**2.58**			
					660	3103	6
Hydrogen (H_2)	**2.016**	**—**	**0.0696**	**191.7**			
Carrier Grade					350	3201	7
Extra Dry (<99.999)					350	3101	6
High Pressure (3500 psig)					695	3800V or 3860TB	20, 21
High Pressure (6000 psig)					703	3800V or 3860TB	20, 21
High Purity					350	3101 or 3201	6, 7
Prepurified					350	3101 or 3201	6, 7
Purified					350	3101 or 3201	6, 7
Research					350	3201 or 3501	7, 9
Semiconductor Purity					350	3201 or 3501	7, 9
ULSI Purity					350	3201 or 3501	7, 9
Ultra High Purity					350	3201	7
Ultraplus™					350	3201	7
Ultra Pure Carrier					350	3201	7
Zero					350	3201	7
Hydrogen Bromide (HBr)	**80.912**	**320**	**2.812 at 77°F**	**4.8**			
Grade 2.8™					330	3471	15
ULSI Purity					330/634*	3471	15
Hydrogen Chloride (HCl)	**36.461**	**613**	**1.268 at 68°F**	**10.6**			
Electronic					330	3471	15
Research					330	3471	15
Technical					330	3471	15
ULSI Purity					330/634*	3471	15
Ultra High Purity					330/634*	3471	15
Hydrogen Selenide (H_2Se)	**80.976**	**124.9**	**2.80 at 77°F**	**4.8**			
Research					660	3403	8
Semiconductor Purity					350/632*	3403	8
ULSI Purity					350/632*	3403	8
Hydrogen Sulfide (H_2S)	**34.076**	**252**	**1.189 at 59°F**	**11.23**			
CP					330	3402	8
Research					330	3402	8
Technical					330	3402	8
Isobutane (C_4H_{10})	**58.124**	**30.7**	**2.01**	**6.5**			
CP					510	3103	6
Instrument					510	3103	6
Research					510	3103	6
Technical					510	3103	6

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Pure Gases

Gas Grade	Mol. Weight	Vapor Pressure (psig at 70°F	Specific Gravity (Air=1)	Specific Volume (ft³/lb. at 70°F)	CGA Connection Number	Equipment Recommendations	Page Number
Isobutylene (C_4H_8)	**56.108**	**24.3**	**1.997**	**6.7**			
CP					510	3103	6
High Purity					510	3103	6
Research					510	3103	6
Isopentane (C_5H_{12})	**72.151**	**-3.2**	**2.48**	**—**			
CP					510	8520	101
Krypton (Kr)	**83.800**	**—**	**2.899**	**4.6**			
Purified					580	3101 or 3201	6, 7
Research					580	3101 or 3201	6, 7
Methane (CH_4)	**16.043**	**—**	**0.554 at 32°F**	**23.7**			
Commercial					350	2401 or 2421	24, 25
CP					350	2401 or 2421	24, 25
High Pressure (3500 psig)					695	3800V or 3860TB	20, 21
High Pressure (6000 psig)					703	3800V or 3860TB	20, 21
Instrument					350	3101 or 3201	6, 7
Purified					350	3101 or 3201	6, 7
Research					350	3101 or 3201	6, 7
Technical					350	2401 or 2421	24, 25
Ultra High Purity					350	3101 or 3201	6, 7
Ultra Pure					350	3101 or 3201	6, 7
Methyl Bromide (CH_3Br)	**94.939**	**13**	**3.355 at 77°F**	**4.1**			
					330/320*	8520	101
Methyl Chloride (CH_3Cl)	**50.488**	**58.7**	**1.74 at 32°F**	**7.6**			
					510/660*	3403	8
Methyl Mercaptan (CH_3SH)	**48.107**	**15**	**1.66 at 68°F**	**8.0**			
					330	3403 or 8520	8, 101
Monomethylamine (CH_3NH_2)	**31.058**	**28.8**	**1.08 at 68°F**	**12.1**			
					705	3403 or 8520	8, 101
Natural Gas	**17.656**	**—**	**0.55**	**24.0**			
					350	2401 or 2421	24, 25
Neon (Ne)	**20.183**	**—**	**0.696**	**19.2**			
CP					580	3101 or 3201	6, 7
First Run					580	3101 or 3201	6, 7
High Purity					580	3101 or 3201	6, 7
Research					580	3101 or 3201	6, 7
Ultra High Purity					580	3101 or 3201	6, 7
Ultra Pure					580	3101 or 3201	6, 7

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Gas Grade	Mol. Weight	Vapor Pressure (psig at 70°F	Specific Gravity (Air=1)	Specific Volume (ft^3/lb. at 70°F)	CGA Connection Number	Equipment Recommendations	Page Number
Nitric Oxide (NO)	**30.006**	**—**	**1.04**	**1.04**			
CP					660	3401 or 3501	8, 9
Nitrogen (N_2)	**28.013**	**—**	**0.967**	**13.8**			
ECD Grade					580	3201	7
Extra Dry (<99.999)					580	3201	7
Grade 6™					580	3201	7
High Pressure (3500 psig)					680	3800V or 3860TB	20, 21
High Pressure (6000 psig)					677	3800V or 3860TB	20, 21
High Purity					580	3201	7
Low Oxygen					580	3201	7
NF–High Purity					580/960*	3201	7
Oxygen Free					580	3201	7
Prepurified (<99.999)					580	2421	25
Research					580	3201	7
Semiconductor Purity					580	3201 or 3501	7, 9
Ultra High Purity					580	3201	7
Ultra Plus™					580	3201	7
Ultra Pure Carrier					580	3201	7
Ultra Zero Ambient Monitoring Zero					580	3201	7
Vehicle Emission Zero					580	3201	7
VOC Free Nitrogen					580	3201	7
Zero					580	3201	7
Nitrogen Dioxide (NO_2)	**46.005**	**0.0 psig**	**1.58**	**4.7**			
CP					660	8520	101
Nitrous Oxide (N_2O)	**44.013**	**745**	**1.53 at 68°F**	**8.7**			
Atomic Absorption					326	2401	24
CP					326	2401	24
Electronic Grade					326	3101 or 3401	6, 8
High Purity					326	3101	6
Industrial					326	2401	24
Research					326	3101	6
Semiconductor Purity					326/712*	3101 or 3401	6, 8
SFC Purity					326	3101	6
Technical					326	2401	24
Ultra High Purity					326/712*	3101	6
Ultraplus™					326	3101	6
USP					326/910*	2401	24

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Oxygen (O_2)	**32.00**	**—**	**1.105 at 77°F**	**12.1**			
Extra Dry (<99.999)					540	3201	7
Grade 5™					540	3201	7
Hydrocarbon Free UHP					540	3201	7
MOS					540	3201	7
Research					540	3201	7
Ultra High Purity					540	3201	7
Ultra Pure Carrier					540	3201	7
Ultra Zero					540	3201	7
USP (<99.999)					540/870*	2421	25
Zero					540	3201	7
Perfluoropropane (C_3F_8)	**188.020**	**100.1**	**6.69 at 68°F**	**2.02**			
Semiconductor Purity					660	3103 or 3403	6, 8
Phosgene ($COCl_2$)	**98.916**	**10.7**	**3.48 at 77°F**	**3.9**			
					660	8520	101
Phosphine (PH_3)	**33.998**	**593**	**1.184**	**11.4**			
Electronic					350/632*	3102 or 3402	6, 8
ULSI Purity					350/632*	3102 or 3402	6, 8
Phosphorous (PF_5) Pentafluoride	**125.966**	**400**	**4.46**	**3.1**	330/660*	3402	8
Propane (C_3H_8)	**44.097**	**109**	**1.55 at 68°F**	**8.5**			
CP					510	3103	6
Instrument					510	3103	6
Natural					510	3103	6
Research					510	3103	6
Propylene (C_3H_6)	**42.081**	**136.6**	**1.48 at 68°F**	**9.06**			
CP					510	3103	6
Polymer Purity					510	3103	6
Research					510	3103	6
Silane (SiH_4)	**32.118**	**—**	**1.114**	**12.0**			
Electronic					350/632*	3501	9
Nitride					350	3501	9
Semiconductor Purity					350/632*	3501	9
Solar/VLSI					350	3501	9
ULSI Purity					350/632*	3501	9
Ultraplus™					350/632*	3501	9
Silicon Tetrafluoride (SiF_4)	**104.080**	**—**	**3.63 at 68°F**	**3.7**			
Semiconductor Purity					330	3501	9

*CGA Connection may vary depending upon cylinder size or gas manufacturer. Check with your gas supplier to determine actual CGA Connection.

Pure Gases

Gas Grade	Mol. Weight	Vapor Pressure (psig at 70°F	Specific Gravity (Air=1)	Specific Volume (ft³/lb. at 70°F)	CGA Connection Number	Equipment Recommendations	Page Number
Sulfur Dioxide (SO_2)	**64.063**	**34.4**	**2.262**	**5.9**			
Anhydrous					660	3403	8
Commercial					660	3403	8
Sulfur Hexafluoride (SF_6)	**146.051**	**320**	**5.11 at 68°F**	**2.5**			
Commercial					590	2401	24
CP					590	2401	24
Electronic					590	3102 or 3402	6, 8
Etchant					590	3102 or 3402	6, 8
Grade 3™					590	2401	24
Grade 4™					590	2401	24
Instrument Purity					590	3102	6
SFC					590	3102	6
ULSI Purity					590	3102 or 3402	6, 8
Ultraplus™					590	3102 or 3402	6, 8
Sulfur Tetrafluoride (SF_4)	**108.058**	**140**	**3.783 at 68°F**	**3.6**			
Technical					330	3471	15
Trimethylamine (C_3H_9N)	**59.112**	**13.3**	**2.087 at 68°F**	**6.4**			
					705	3403 or 8520	8, 101
Vinyl Methyl Ether (C_3H_6O)	**58.080**	**10.6**	**1.99 at 68°F**	**6.7**			
					290	3401	8
Xenon (Xe)	**131.300**	**—**	**4.560**	**2.9**			
Purified					580	3101 or 3201	6, 7
Research					580	3101 or 3201	6, 7

*CGA Connection may vary depending upon cylinder size or gas manufacturer. Check with your gas supplier to determine actual CGA Connection.

Pure Gases in Lecture Bottles

Gas Grade	CGA Connection Number	Equipment Recommendations	Page Number
Air			
Zero	170	3900	30
Dry	170/180*	3910	30
Allene			
	170	3910	30
Ammonia			
Anhydrous, 99.99%	110/180*	T3920	30
Argon			
Prepurified	170/180*	3910	30
Ultra High Purity	180	3900	30
Boron Trichloride			
CP	180	3992-180	31
Boron Trifluoride			
CP	180	T3920	30
1, 3 Butadiene			
CP	170	3910	30
Instrument	170	3910	30
Butane			
CP	170	3910	30
Instrument	180	3910	30
1-Butene			
CP	170	3910	30
cis-2-Butene			
Technical	170	3910	30
trans-2-Butene			
Technical	170	3910	30
(cis & trans) 2-Butene			
Technical	170	3910	30
Carbon Dioxide			
Bone Dry	170/180*	3910	30
CP	180	3910	30
Carbon Monoxide			
Commercial	170	3910	30
CP	170/180*	3910	30
Research	180	3900	30
Carbonyl Sulfide			
	180	T3920	30

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Pure Gases in Lecture Bottles

Gas Grade	CGA Connection Number	Equipment Recommendations	Page Number
Chlorine			
High Purity	110/180*	T3920	30
Ultra High Purity	180	T3920	30
Cyclopropane			
	170	3910	30
Deuterium			
CP	170/180*	3900	30
Dimethylamine			
	180	T3920	30
Dimethyl Ether			
	170	3910	30
Ethane			
CP	170/180*	3910	30
Ethyl Chloride			
CP	170	3992-170	31
Ethylene			
CP	170/180*	3910	30
Technical	170	3910	30
Ethylene Oxide			
	180	3992-180	31
Halocarbon 12 (Dichlorodifluoromethane)			
	170	3991	31
Halocarbon 13 (Chlorotrifluoromethane)			
	180	3991	31
Halocarbon 14 (Tetrafluoromethane)			
	170	3910	30
Halocarbon 22 (Chlorodifluoromethane)			
	170	3910	30
Halocarbon 114 (1,2-Dichlorotetrafluoroethane)			
	170	3910	30
Halocarbon 142B (1-Chloro-1, 1-Difluoroethane)			
	170	3910	30

*CGA Connection may vary depending upon cylinder size or gas manufacturer. Check with your gas supplier to determine actual CGA Connection.

Pure Gases in Lecture Bottles

Gas Grade	CGA Connection Number	Equipment Recommendations	Page Number
Halocarbon C-318 (Octafluorocyclobutane)	170	3910	30
Halocarbon 1113 (Chlorotrifluoroethylene)	170	3910	30
Helium			
High Purity	170/180*	3900	30
Hexafluoropropylene	170	3910	30
Hydrogen			
Prepurified	170/180*	3910	30
Purified	170	3910	30
Ultra High Purity	180	3900	30
Hydrogen Bromide	110/180*	T3920	30
Hydrogen Chloride			
Electronic	180	T3920	30
Technical	110/180*	T3920	30
Hydrogen Fluoride			
CP	180	3992-180	31
99.90%	180	3992-180	31
Hydrogen Sulfide			
CP	110/180*	T3920	30
Isobutane			
CP	170	3910	30
Instrument	170	3910	30
Isobutylene			
CP	170	3910	30
Krypton			
Research	180	3900	30
Methane			
CP	170/180*	3910	30
Instrument	180	3900	30
Purified	170	3910	30
Technical	170	3910	30
Ultra High Purity	170	3900	30
Ultra Pure	170	3900	30

*CGA Connection may vary depending upon cylinder size or gas manufacturer. Check with your gas supplier to determine actual CGA Connection.

Pure Gases in Lecture Bottles

Gas Grade	CGA Connection Number	Equipment Recommendations	Page Number
Methyl Bromide			
	170	3992-170	31
Methyl Chloride			
	110/170/180*	3992	31
Methyl Mercaptan			
	180	3992	31
Monomethylamine			
	110/180*	3992	31
Nitrogen			
Prepurified	170/180*	3910	30
Ultra High Purity	170/180*	3900	30
Nitrous Oxide			
CP	170	3910	30
Oxygen			
Extra Dry	170/180*	3910	30
Zero	170	3900	30
Phosphorous Pentafluoride			
	330	T3920	30
Propane			
CP	170	3910	30
Instrument	170/180*	3900	30
Propylene			
CP	170/180*	3910	30
Sulfur Dioxide			
Anhydrous	180	T3920	30
Sulfur Hexafluoride			
CP	170	3910	30
Sulfur Tetrafluoride			
	110/180*	T3920	30
Trimethylamine			
	180	3992	31
Vinyl Bromide			
	180	3992	31
Vinyl Methyl Ether			
	180	3992	31

*CGA Connection may vary depending upon cylinder size or gas manufacturer. Check with your gas supplier to determine actual CGA Connection.

Two Component Gas Mixtures

Minor Component Balance Gas	CGA Connection Number	Equipment Recommendations	Page Number
Acetaldehyde			
In Helium	350	3401 or 3501	8, 9
In Nitrogen	350	3401 or 3501	8, 9
Acrylonitrile			
In Helium	350	3401 or 3501	8, 9
In Nitrogen	350	3401 or 3501	8, 9
Ammonia			
In Air	660/705*	3401 or 3501	8, 9
In Argon	705	3401 or 3501	8, 9
In Helium	705	3401 or 3501	8, 9
In Hydrogen	330/660/705*	3401 or 3501	8, 9
In Nitrogen	330/660/705*	3401 or 3501	8, 9
Argon			
In Helium	580	3101 or 3201	6, 7
In Hydrogen	350	3101 or 3201	6, 7
In Nitrogen	580	3101 or 3201	6, 7
In Oxygen	296	3101 or 3201	6, 7
Benzene			
In Air	590	3101 or 3201	6, 7
In Helium	350	3101 or 3201	6, 7
In Nitrogen	350	3101 or 3201	6, 7
Butane			
In Air	590	3101 or 3201	6, 7
In Argon	350	3101 or 3201	6, 7
In Helium	350	3101 or 3201	6, 7
In Hydrogen	350	3101 or 3201	6, 7
In Nitrogen	350	3101 or 3201	6, 7
Carbon Dioxide			
In Air	580/590*	3101 or 3201	6, 7
In Argon	580	3101 or 3201	6, 7
In Carbon Monoxide	350	3101 or 3201	6, 7
In Helium	580	3101 or 3201	6, 7
In Hydrogen	350	3101 or 3201	6, 7
In Nitrogen	580	3101 or 3201	6, 7
In Oxygen	296/540*	3101 or 3201	6, 7
Carbon Disulfide			
In Argon	330	3401 or 3501	8, 9
In Helium	330	3401 or 3501	8, 9
In Nitrogen	330	3401 or 3501	8, 9

*CGA Connection may vary depending upon cylinder size or gas manufacturer. Check with your gas supplier to determine actual CGA Connection.

**CGA 590 when oxygen concentration is ≤ 23%. CGA 296 when oxygen concentration is >23%.

Two Component Gas Mixtures

Gas Grade	CGA Connection Number	Equipment Recommendations	Page Number
Carbon Monoxide			
In Air	590	3101 or 3201	6, 7
In Argon	350	3101 or 3201	6, 7
In Helium	350	3101 or 3201	6, 7
In Hydrogen	350	3101 or 3201	6, 7
In Nitrogen	350	3101 or 3201	6, 7
Carbonyl Sulfide			
In Argon	330	3401 or 3501	8, 9
In Helium	330	3401 or 3501	8, 9
In Nitrogen	330	3401 or 3501	8, 9
Chlorine			
In Argon	660	3470	15
In Helium	660	3470	15
In Nitrogen	330/660*	3470	15
Ethane			
In Air	590	3101 or 3201	6, 7
In Argon	350	3101 or 3201	6, 7
In Helium	350	3101 or 3201	6, 7
In Hydrogen	350	3101 or 3201	6, 7
In Nitrogen	350	3101 or 3201	6, 7
Ethanol			
In Nitrogen	350	3101 or 3201	6, 7
Ethylene			
In Air	590	3101 or 3201	6, 7
In Argon	350	3101 or 3201	6, 7
In Helium	350	3101 or 3201	6, 7
In Nitrogen	350	3101 or 3201	6, 7
Ethylene Oxide			
In Air	590	3401 or 3501	8, 9
In Nitrogen	350	3401 or 3501	8, 9
Halocarbon 12			
In Air	590	3101 or 3201	6, 7
In Argon	580	3101 or 3201	6, 7
In Helium	580	3101 or 3201	6, 7
In Nitrogen	580	3101 or 3201	6, 7

*CGA Connection may vary depending upon cylinder size or gas manufacturer. Check with your gas supplier to determine actual CGA Connection.

**CGA 590 when oxygen concentration is ≤ 23%. CGA 296 when oxygen concentration is >23%.

Two Component Gas Mixtures

Gas Grade	CGA Connection Number	Equipment Recommendations	Page Number
Helium			
In Argon	580	3101 or 3201	6, 7
In Hydrogen	350	3101 or 3201	6, 7
In Nitrogen	580	3101 or 3201	6, 7
In Oxygen	296	3101 or 3201	6, 7
Hexane			
In Air	590	3101 or 3201	6, 7
In Argon	350	3101 or 3201	6, 7
In Helium	350	3101 or 3201	6, 7
In Hydrogen	350	3101 or 3201	6, 7
In Nitrogen	350	3101 or 3201	6, 7
Hydrogen			
In Air	590	3101 or 3201	6, 7
In Argon	350	3101 or 3201	6, 7
In Helium	350	3101 or 3201	6, 7
In Nitrogen	350	3101 or 3201	6, 7
Hydrogen Chloride			
In Argon	330	3470	15
In Helium	330	3470	15
In Nitrogen	330	3470	15
Hydrogen Cyanide			
In Helium	350	3470	15
In Nitrogen	350	3470	15
Hydrogen Sulfide			
In Air	330	3401 or 3501	8, 9
In Argon	330	3401 or 3501	8, 9
In Helium	330	3401 or 3501	8, 9
In Hydrogen	330	3401 or 3501	8, 9
In Methane	330	3401 or 3501	8, 9
In Nitrogen	330	3401 or 3501	8, 9
Isobutane			
In Air	590	3101 or 3201	6, 7
In Argon	350	3101 or 3201	6, 7
In Helium	350	3101 or 3201	6, 7
In Hydrogen	350	3101 or 3201	6, 7
In Nitrogen	350	3101 or 3201	6, 7

*CGA Connection may vary depending upon cylinder size or gas manufacturer. Check with your gas supplier to determine actual CGA Connection.

**CGA 590 when oxygen concentration is ≤ 23%. CGA 296 when oxygen concentration is >23%.

Two Component Gas Mixtures

Gas Grade	CGA Connection Number	Equipment Recommendations	Page Number
Methane			
In Air	590	3101 or 3201	6, 7
In Argon	350	3101 or 3201	6, 7
In Helium	350	3101 or 3201	6, 7
In Hydrogen	350	3101 or 3201	6, 7
In Nitrogen	350	3101 or 3201	6, 7
Methanol			
In Nitrogen	350	3101 or 3201	6, 7
Methyl Mercaptan			
In Helium	330/350*	3401 or 3501	8, 9
In Nitrogen	330/350*	3401 or 3501	8, 9
Moisture			
In Argon	580	3101 or 3201	6, 7
In Helium	580	3101 or 3201	6, 7
In Hydrogen	350	3101 or 3201	6, 7
In Nitrogen	580	3101 or 3201	6, 7
Nitric Oxide			
In Argon	660	3401 or 3501	8, 9
In Helium	660	3401 or 3501	8, 9
In Nitrogen	660	3401 or 3501	8, 9
Nitrogen			
In Argon	580	3101 or 3201	6, 7
In Helium	580	3101 or 3201	6, 7
In Hydrogen	350	3101 or 3201	6, 7
In Oxygen	296	3101 or 3201	6, 7
Nitrogen Dioxide			
In Air	660	3401 or 3501	8, 9
In Argon	660	3401 or 3501	8, 9
In Helium	660	3401 or 3501	8, 9
In Nitrogen	660	3401 or 3501	8, 9
Nitrous Oxide			
In Air	590	3101 or 3201	6, 7
In Nitrogen	590	3101 or 3201	6, 7
Oxygen			
In Argon	**	3101 or 3201	6, 7
In Helium	**	3101 or 3201	6, 7
In Nitrogen	**	3101 or 3201	6, 7

*CGA Connection may vary depending upon cylinder size or gas manufacturer. Check with your gas supplier to determine actual CGA Connection.

**CGA 590 when oxygen concentration is ≤ 23%. CGA 296 when oxygen concentration is >23%.

Two Component Gas Mixtures

Gas Grade	CGA Connection Number	Equipment Recommendations	Page Number
Pentane			
In Air	590	3101 or 3201	6, 7
In Argon	350	3101 or 3201	6, 7
In Helium	350	3101 or 3201	6, 7
In Hydrogen	350	3101 or 3201	6, 7
In Nitrogen	350	3101 or 3201	6, 7
Propane			
In Air	590	3101 or 3201	6, 7
In Argon	350	3101 or 3201	6, 7
In Helium	350	3101 or 3201	6, 7
In Hydrogen	350	3101 or 3201	6, 7
In Nitrogen	350	3101 or 3201	6, 7
Propylene			
In Air	590	3101 or 3201	6, 7
In Argon	350	3101 or 3201	6, 7
In Helium	350	3101 or 3201	6, 7
In Hydrogen	350	3101 or 3201	6, 7
In Nitrogen	350	3101 or 3201	6, 7
Sulfur Dioxide			
In Air	330/660*	3401 or 3501	8, 9
In Argon	660	3401 or 3501	8, 9
In Helium	660	3401 or 3501	8, 9
In Nitrogen	330/660*	3401 or 3501	8, 9
Sulfur Hexafluoride			
In Air	590	3101 or 3201	6, 7
In Argon	580	3101 or 3201	6, 7
In Helium	580	3101 or 3201	6, 7
In Nitrogen	580	3101 or 3201	6, 7
Toluene			
In Air	350	3101 or 3201	6, 7
In Helium	350	3101 or 3201	6, 7
In Nitrogen	350/510*	3101 or 3201	6, 7
Vinyl Chloride			
In Air	590	3401 or 3501	8, 9
In Helium	350	3401 or 3501	8, 9
In Nitrogen	350	3401 or 3501	8, 9

*CGA Connection may vary depending upon cylinder size or gas manufacturer. Check with your gas supplier to determine actual CGA Connection.

**CGA 590 when oxygen concentration is ≤ 23%. CGA 296 when oxygen concentration is >23%.