PRAXAIR
Making our planet more productive

Hydrocarbon Processing

Overview

Full Spectrum Product Line

Today's hydrocarbon processing industries (HPI) requires high precision measurement, uniform stability, specialty mixes, and reference standards. Praxair's Spectrum products offer a wide range of certified mixes, industry reference standards, and high purity organics. The production of natural gas, liquefied petroleum gas, engine fuels, and ethane are analyzed to meet process feed and salable product specifications. Spectrum gases and liquid mixes are formulated to certifiable references and to meet standards for your low sulfur fuels and natural gases, vapor pressure, LPG standards, and HVOC requirements. Praxair possesses an extensive portfolio of assayed chemicals to customize your requirements.

Centers of Excellence

To effectively service North America, Praxair has three centers of excellence dedicated for hydrocarbons. These centers are located in Geismar, Louisiana; Edmonton, Alberta, Canada, and Mexico City, Mexico. Each of these centers have advanced cylinder treatment capabilities, blending systems, and analytical equipment to effectively service the HPI market. They are supported by specialty gas experts who are actively involved in the HPI market.

Other support comes from Praxair R&D, where teams of scientists are dedicated to the development of specialty gas products and services.

Reliable Production and Distribution

Praxair possesses multiple ISO 9001:2000 certified plants with 5 specialty gas plants and North America's largest gas production facility working to provide the highest quality products, product availability, and meeting on time delivery requirements. With over 600 US locations, our distribution network accompanied by our ability to supply custom delivery solutions for packaged and bulk products allows Praxair to offer packaged and bulk options that may help you increase your productivity.

A Complete Range of Gas Delivery Equipment

Praxair's offers a wide range of essential equipment to meet the demands of today's hydrocarbon processing facility laboratories and process feed monitoring instrumentation gas delivery solutions. From specialty regulators for corrosive service to hydrogen laboratory generators, Praxair's expertise can help you provide process improvement which can result in reduced costs.

Hydrocarbon Processing

Overview

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Oil and gas exploration...refineries...petrochemical/chemical plants...gas processing units...distribution networks. Perfomance expectations for each of these hydrocarbon processing industry (HPI) operations have never been greater. Key to achieving and maintaining this performance level are the many gases employed in this multipurpose industry. Meeting today's complex hydrocarbon processing challenges requires more than a reliable, single-source supplier of industrial gases. It takes a total solutions company like Praxair.

As a world leader in manufacturing and distributing atmospheric, process and specialty gases, Praxair is uniquely positioned to apply unparalleled systems and resources to create innovative, cost-effective solutions for the hydrocarbon processing industry – now and in the future.

Praxair hydrocarbon processing solutions will help improve productivity, increase capacity, reduce emissions and enable performance monitoring and tracking. From bulk quantities to 17-liter portables, Praxair offers the largest selection of gases, containers, and delivery systems in the industry.

Industry Wide Association Interface

Most customers have individual needs, but in some cases problems are evaluated and resolved under the umbrella of a trade or industry wide association. Praxair works with many of these organizations, including ASTM D-2, D-3, GPA, WSPA and API.

Refining

Refiners worldwide rely on Praxair's extensive product capabilities, high-quality processes, vast distribution network and commitment to customer service and satisfaction. Pipeline and on-site production...bulk, tube trailer and cylinder supply...a complete line of equipment and accessories – Praxair offers a full spectrum of products and services to meet your needs.

Please refer to page D•177 for information on the products that support the refining industry.

Natural Gas

From the well head to the power plant, Praxair delivers products and services needed by the natural gas industry. Supported by the most extensive distribution network in North America, Praxair is dedicated to exploring new and innovative solutions to the nation's energy and natural gas demands.

Please refer to D•182 for information on the products that support the natural gas industry.

Petrochemical

Praxair's specialty gases production facilities provide products for petro-chemical and petroleum related products. Including a wide range of both pure organics and mixtures and the delivery systems to support them. Praxair is the hydrocarbon processing industry's preferred supplier.

Please refer to page D•183 for information on the products that support the petrochemical industry.

Hydrocarbon Processing

Refining

A Complete Product Line

Whether for lab analysis or process control, Praxair offers a wide range of pure organics and mixtures in many container types and sizes. Our ISO 9001:2000 Certified Advanced Application Group in Geismar, Louisiana, for example, specializes in unusual organic matrices and trace impurities.

Praxair's high-quality manufacturing process features:

- Computerized phase behavior evaluation
- High-purity assayed raw materials
- Proprietary cylinder preparation
- Precise gravimetric blending systems
- Certification and/or confirmation analysis

Typical Liquid Mixtures

ASTM D-3710 Compounds	Conc. (LV%)
Propane	1.0
Isobutane	3.0
n-Butane	10.0
Isopentane	9.0
n-Pentane	7.0
2-Methylpentane	5.0
n-Hexane	5.0
2,4-Dimethylpentane	5.0
n-Heptane	9.0
Toluene	10.0
n-Octane	5.0
p-Xylene	12.0
n-Propylbenzene	3.0
n-Decane	3.0
n-Butylbenzene	3.0
n-Dodecane	3.0
n-Tridecane	2.0
n-Tetradecane	2.0
n-Pentadecane	2.0

Typical Refinery Gas Standard

Compounds	Conc.
Hydrogen	38.5%
Methane	15.0%
Propane	8.0%
Ethylene	7.5%
Ethane	7.0%
Nitrogen	4.0%
Carbon Dioxide	3.0%
Propylene	3.0%
n-Butane	2.5%
Isobutane	2.0%
Carbon Monoxide	2.0%
1-Butene	1.0%
Isobutylene	1.0%
trans-2-Butene	1.0%
cis-2-Butene	1.0%
Acetylene	1.0%
n-Pentane	0.5%
Isopentane	0.5%
Argon	1.0%
1-Pentene	0.1%
trans-2-Pentene	0.1%
cis-2-Pentene	0.1%
2-methyl 2-Pentene	0.1%
n-Hexane	0.1%

Trace Impurity Mixtures

Fuel Standards	
MTBE	100 ppm
Isooctane	Balance
Dibutyl Disulfide	1 ppm
Isooctane	Balance
Industrial Hygiene	
Hydrogen Sulfide	Up to 300 ppm
Carbon Monoxide	Up to 300 ppm
Methane	2.5%
Oxygen	19%
Nitrogen	Balance

See pages D•185-202 for more information.

Environmental	
Carbon Dioxide	10%
Carbon Monoxide	50 ppm
Nitric Oxide	100 ppm
Sulfir Dioxide	250 ppm
Nitrogen	Balance

See pages D•157-164 for more information.

Total Sulfur Standards

Reduced sulfur blends in inert matrix.
NIST traceable to H_2S SRM.

Compounds	Minimum Conc.
Carbon Disulfide	1.0 ppm
Carbonyl Sulfide	95 ppb
Dimethyl Disulfide*	0.5 ppm
Dimethyl Sulfide	0.5 ppm
Ethyl Mercaptan	1.0 ppm
Methyl Mercaptan	1.0 ppm
Propyl Mercaptan	2.0 ppm

* Dimethyl Disulfide must be blended separately due to instability and reactivity with other components.

Hydrocarbon Processing

Multicomponent Mixes

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Praxair can supply gas blends containing over 100 individual components. Our Mix-Cal software program evaluates your specific product mix needs verifying component compatibility and calculates the mixture requirements ensuring safe multicomponent high quality gas blends.

- (1S)-(-)-B-Pinene
- (R)-3,7-Dimethyl-1,6-octadiene
- (S)-3,7-Dimethyl-1,6-octadiene
- 1,1,1,2,2,3,3,4,4-Nonafluoro-4-methoxybutane
- 1,1,2-Trimethylcyclopentane
- 1,1,3-Trimethylcyclopentane
- 1,1-Dichloro-1,2,2,2-tetrafluoroethane
- 1,1-Diethylcyclopentane
- 1,1-Dimethyl-2-ethylcyclopentane
- 1,1-Dimethylcyclohexane
- 1,1-Dimethylcyclopentane
- 1,2,3,4-Tetrahydronaphthalene
- 1,2,3,5-Tetramethylbenzene
- 1,2,3-Trimethylbenzene
- 1,2,4,5-Tetramethylbenzene
- 1,2,4-Triethylbenzene
- 1,2,4-Trimethylbenzene
- 1,2-Dichlorobenzene
- 1,2-Dichloroethane-d4
- 1,2-Diphenylethane
- 1,2-Ethanedithiol
- 1,2-Hexadiene
- 1,2-Pentadiene
- 1,3,5-Triethylbenzene
- 1,3-Butadiene
- 1,3-Cyclopentadiene
- 1,3-Dichloro-1,1,2,2,3-pentafluoropropane
- 1,3-Dichlorobenzene
- 1,3-Dichloropropenes (Mixed Isomers)
- 1,3-Dioxane
- 1,3-Hexachlorobutadiene
- 1,3-Propanediol
- 1,4-Dichlorobenzene
- 1,4-Dioxane
- 1,4-Pentadiene
- 1,5-Hexadiene
- 1,6-Hexanedithiol
- 1,cis-2,cis-3-Trimethylcyclopentane
- 1,cis-2,cis-4-Trimethylcyclopentane
- 1,cis-2,trans-3-Trimethylcyclopentane
- 1,cis-2,trans-4-Trimethylcyclopentane
- 1,trans-2,cis-3-Trimethylcyclopentane
- 1,trans-2,cis-4-Trimethylcyclopentane
- 1-Bromo-4-fluorobenzene
- 1-Bromobutane
- 1-Bromopropane
- 1-Butene
- 1-Chloro-1,1,2,2-tetrafluoroethane
- 1-Chloro-1,1-difluoroethane
- 1-Chloro-1,2,2,2-tetrafluoroethane
- 1-Chloro-1-fluoroethylene
- 1-Chloro-2,2,2-trifluoroethane
- 1-Decanethiol
- 1-Decanol
- 1-Decyne
- 1-Eicosene
- 1-Ethydecahydronaphthalene (Mixed Isomers)
- 1-Ethyl-cis-decahydronaphthalene
- 1-Ethylcyclohexene
- 1-Ethylcyclopentene
- 1-Ethyl-trans-decahydronaphthalene
- 1-Fluorobutane
- 1-Fluoropentane
- 1-Heptadecene
- 1-Heptanethiol
- 1-Heptyne
- 1-Hexanethiol
- 1-Hexyne
- 1-Methoxy-2-methylbutane
- 1-Methyl-1-butyne
- 1-Methyl-1-ethylcyclopentane
- 1-Methyl-1-n-propylcyclopentane
- 1-Methyl-1-propanethiol
- 1-Methyl-2-pyrrolidinone
- 1-Methyl-4-isopropylcyclohexane
- 1-Methyl-cis-decahydronaphthalene
- 1-Methylcyclohexene
- 1-Methylcyclopentene
- 1-Methyldecahydronaphthalene (Mixed Isomers)
- 1-Methylnaphthalene
- 1-Methyl-trans-decahydronaphthalene
- 1-Nitrobutane
- 1-Nitropropane
- 1-Nonadecene
- 1-Nonanethiol
- 1-Nonene
- 1-Nonyne
- 1-Octanethiol
- 1-Octyne
- 1-Pentadecene
- 1-Pentanethiol
- 1-Pentyne
- 1-Propanethiol
- 1-Tridecene
- 1-Undecanol
- 1-Undecene
- 2,2,3,3-Tetramethylbutane
- 2,2,3,3-Tetramethylhexane
- 2,2,3,3-Tetramethylpentane
- 2,2,3,4-Tetramethylpentane
- 2,2,3-Trimethylbutane
- 2,2,3-Trimethylhexane
- 2,2,3-Trimethylpentane
- 2,2,4,4-Tetramethylpentane
- 2,2,4-Trimethylhexane
- 2,2,5,5-Tetramethylhexane
- 2,2,5-Trimethylhexane
- 2,2-Dichloro-1,1,1-trifluoroethane
- 2,2-Difluoropropane
- 2,2-Dimethyl-3-ethylpentane
- 2,2-Dimethylheptane
- 2,2-Dimethylhexane
- 2,2-Dimethylpentane
- 2,2-Dimethylpropane
- 2,3,3,4-Tetramethylpentane
- 2,3,3-Trimethyl-1-butene
- 2,3,3-Trimethyl-1-pentene
- 2,3,3-Trimethylhexane
- 2,3,3-Trimethylpentane
- 2,3,5-Trimethylhexane
- 2,3-Dimethyl-1,3-butadiene
- 2,3-Dimethyl-1-butene
- 2,3-Dimethyl-1-hexene
- 2,3-Dimethyl-1-pentene
- 2,3-Dimethyl-2-butene
- 2,3-Dimethyl-2-hexene
- 2,3-Dimethyl-2-pentene
- 2,3-Dimethylhexane
- 2,3-Dimethylpentane
- 2,3-Hexadiene
- 2,3-Pentadiene
- 2,4,4-Trimethylhexane
- 2,4-Dimethyl-1-pentene
- 2,4-Dimethyl-2-pentene
- 2,4-Dimethyl-3-ethylpentane
- 2,4-Dimethyl-3-isopropylpentane
- 2,4-Dimethylhexane
- 2,5-Dimethylfuran
- 2,5-Dimethylhexane
- 2,6-Dimethyl-1,6-heptadiene
- 2,6-Dimethylheptane
- 2,6-Dimethylnaphthalene
- 2,6-Octadiene
- 2,7-Dimethyloctane
- 2-Bromopropane
- 2-Bromothiophene
- 2-Butanol
- 2-Chloro-1,1-difluoroethylene
- 2-Chloro-2-ethylvinyl ether
- 2-Ethyl-1-hexanol
- 2-Ethyl-1-hexene
- 2-Ethyl-1-pentene

Hydrocarbon Processing

Multicomponent Mixes

Praxair is a full service supplier for all your hydrocarbon processing gas needs. Refer to section E for information on Praxair's complete line of gas delivery equipment. For additional information or technical assistance, contact our North American Technical Support Center at 1-877-PRAXAIR.

- 2-Ethyl-3-methyl-1-butene
- 2-Hexanone
- 2H-Pentafluoropropylene
- 2-Methoxybenzyl alcohol
- 2-Methyl-1,5-hexadiene
- 2-Methyl-1-butanethiol
- 2-Methyl-1-buten-3-yne
- 2-Methyl-1-heptene
- 2-Methyl-1-hexene
- 2-Methyl-1-pentene
- 2-Methyl-1-propanethiol
- 2-Methyl-2,4-hexadiene
- 2-Methyl-2-butanethiol
- 2-Methyl-2-butanol
- 2-Methyl-2-hexene
- 2-Methyl-2-nitropropane
- 2-Methyl-3-ethylpentane
- 2-Methylfuran
- 2-Methylheptane
- 2-Methylhexane
- 2-Methylnaphthalene
- 2-Methylnonane
- 2-Methyloctane
- 2-Methylthiophene
- 2-Nitropropane
- 2-Octene (Mixed Isomers)
- 2-Pentene (Mixed Isomers)
- 2-Pentyne
- 2-Propanethiol
- 3,3,3-Trifluoropropene
- 3,3,4-Trimethylheptane
- 3,3,4-Trimethylhexane
- 3,3,5-Trimethylheptane
- 3,3-Dichloro-1,1,1,2,2-pentafluoropropane
- 3,3-Diethylpentane
- 3,3-Dimethyl-1-butene
- 3,3-Dimethyl-1-pentene
- 3,3-Dimethylhexane
- 3,3-Dimethylpentane
- 3,4-Dimethyl-1-pentene
- 3,4-Dimethylhexane
- 3,7-Dimethyl-1,6-octadiene
- 3-Ethyl-1-hexene
- 3-Ethyl-1-pentene
- 3-Ethyl-2-pentene
- 3-Ethylcyclopentene
- 3-Ethylheptane
- 3-Ethylhexane
- 3-Ethylpentane
- 3-Ethylthiophene
- 3-Methyl-1,2-pentadiene
- 3-Methyl-1-butene
- 3-Methyl-1-heptene
- 3-Methyl-1-hexene
- 3-Methyl-1-pentenes (Mixed Isomers)
- 3-Methyl-2-butanol
- 3-Methyl-2-pentenes (Mixed Isomers)
- 3-Methyl-3-ethylpentane
- 3-Methyl-3-heptene
- 3-Methylcyclopentene
- 3-Methylhexane
- 3-Methylnonane
- 3-Methyloctane
- 3-Methylthiophene
- 4,4-Dimethyl-1-pentene
- 4-Ethyl-1-hexene
- 4-Methyl-1-heptene
- 4-Methyl-1-hexene
- 4-Methyl-1-pentene
- 4-Methyl-2-hexene (Mixed Isomers)
- 4-Methyl-2-pentene (Mixed Isomers)
- 4-Methylcyclopentene
- 4-Methylheptane
- 4-Methylnonane
- 4-Methyloctane
- 4-Methylstyrene
- 4-tert-Butylhydroquinone
- 4-Vinyl-1-cyclohexene
- 5-Ethylidene-2-norbornene
- 5-Methyl-1-hexene
- 5-Methylnonane
- 5-Nonanone
- 5-Vinyl-2-norbornene
- 6-Methyl-2-heptene
- 9-Ethyl-cis-decahydronaphthalene
- 9-Ethyldecahydronaphthalene (Mixed Isomers)
- 9-Ethyl-trans-decahydronaphthalene
- Acetaldehyde
- Acetic acid
- Acetone
- Acrolein
- Acrylic acid
- Acrylonitrile
- Allyl alcohol
- Allyl chloride
- Amyl ethyl ether
- Amyl tert-butyl ether
- Aniline
- Benzaldehyde
- Benzene
- Benzyl alcohol
- Benzyl chloride
- Benzyl sulfide
- Butane
- Butyl acrylate
- Butylcyclohexane
- Butylcyclopentane
- Carbon Disulfide
- Carbon Disulfide
- Carbon tetrachloride
- Carbonyl sulfide
- Chlorobenzene
- Chloroform
- cis-1,2-Dichloroethylene
- cis-1,2-Diethylcyclopentane
- cis-1,2-Dimethylcyclohexane
- cis-1,2-Dimethylcyclopentane
- cis-1,2-Dimethylcyclopropane
- cis-1,3-Dichloro-1-propene
- cis-1,3-Dimethylcyclohexane
- cis-1,3-Dimethylcyclopentane
- cis-1,3-Pentadiene
- cis-1,4-Dimethylcyclohexane
- cis-1-Methyl-2-ethylcyclopentane
- cis-1-Methyl-3-ethylcyclopentane
- cis-2,2-Dimethyl-3-hexene
- cis-2-Butene
- cis-2-Heptene
- cis-2-Hexene
- cis-2-Methyl-3-hexene
- cis-2-Octene
- cis-3,4-Dimethyl-2-pentene
- cis-3-Heptene
- cis-3-Hexene
- cis-3-Methyl-2-hexene
- cis-3-Methyl-2-pentene
- cis-3-Methyl-3-hexene
- cis-3-Octene
- cis-4,4-Dimethyl-2-pentene
- cis-4-Methyl-2-hexene
- cis-4-Methyl-2-pentene
- cis-4-Octene
- cis-5-Methyl-2-hexene
- cis-Decahydronaphthalene
- cis-Penten-3-yne-1
- Cresol (Mixed Isomers)
- Cyanogen
- Cycloheptane
- Cyclohexanol
- Cyclohexanone
- Cyclohexene
- Cyclononane
- Cyclooctane
- Cyclopropane

Hydrocarbon Processing

Multicomponent Mixes

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Praxair can supply gas blends containing over 100 individual components. Our Mix-Cal software program evaluates your specific product mix needs verifying component compatibility and calculates the mixture requirements ensuring safe multicomponent high quality gas blends.

- Decahydronaphthalene, (Mixed Isomers)
- Dibenzothiophene
- Dicyclohexane
- Dicyclopentadiene
- Diethanolamine
- Diethyl Disulfide
- Diethyl ether
- Diethyl sulfide
- Diethylamine
- Diethylbenzenes (Mixed Isomers)
- Diethyoxymethane
- Difluoromethane
- Diisobutyl sulfide
- Diisopropyl disulfide
- Diisopropyl sulfide
- Dimethyl ether
- Dimethyl methylphosphonate
- Dimethyl sulfide
- Dimethyl trisulfide
- Dimethylacetamide
- Dimethylamine
- Dimethylethylamine
- Dimethylnaphthalenes (Mixed Isomers)
- Dimethylsulfoxide
- Diphenyl
- Diphenylmethane
- Di-tert-butyl peroxide
- Di-tert-butyl sulfide
- d-Limonene
- Docosane
- Dotriacontane
- Eicosane
- Epichlorohydrin
- Ethane
- Ethanethiol (Ethyl Mercaptan)
- Ethanol
- Ethyl chloride
- Ethyl disulfide
- Ethyl fluoride
- Ethyl iodide
- Ethyl methacrylate
- Ethyl methyl disulfide
- Ethyl methyl ether
- Ethyl propyl ether
- Ethyl tert-amyl ether
- Ethyl tert-butyl ether
- Ethylacetylene
- Ethylamine
- Ethylcyclobutane
- Ethylcycloheptane
- Ethylcyclohexane
- Ethylcyclopentane
- Ethylcyclopropane
- Ethylene
- Ethylene dibromide
- Ethylene glycol
- Ethylene glycol monobutyl ether
- Ethylene oxide
- Ethylenediamine
- Fluorobenzene
- Formaldehyde
- Furfural
- Halocarbon-410a
- Halothane
- Helium-3
- Henicosane
- Heptacosane
- Hexachlorobenzene
- Hexacosane
- Hexafluoro-1,3-butadiene
- Hexamethyldisiloxane
- Hexatriacontane
- Humulene
- Hydrogen
- Hydrogen bromide
- Hydrogen chloride
- Hydrogen fluoride
- Hydrogen iodide
- Hydrogen sulfide
- Indan
- Indene
- Isoamyl acetate
- Isoamyl mercaptan
- Isobutane
- Isobutanol
- Isobutyl acrylate
- Isobutyl Mercaptan
- Isobutyl methacrylate
- Isobutylbenzene
- Isobutylcyclohexane
- Isobutylcyclopentane
- Isobutylene
- Isohexene
- Isopentane
- Isoprene
- Isopropanol
- Isopropyl Disulfide
- Isopropyl ether
- Isopropyl fluoride
- Isopropyl Mercaptan
- Isopropyl nitrate
- Isopropylamine
- Isopropylbenzene
- Isopropylcyclohexane
- Isopropylcyclopentane
- m-Chlorotoluene
- m-Cresol
- m-Diethylbenzene
- Menthol
- Methane
- Methanol
- Methyl acrylate
- Methyl bromide
- Methyl chloride
- Methyl ethyl sulfide
- Methyl fluoride
- Methyl formate
- Methyl isobutyl ketone
- Methyl isopropyl ketone
- Methyl mercaptan
- Methyl perfluoropropyl ether
- Methyl propyl ether
- Methyl tert-butyl ether
- Methylacetylene
- Methylamine
- Methylcyclobutane
- Methylcycloheptane
- Methylcyclohexane
- Methylcyclopentane
- Methyl-d3-benzene-d5
- Methyl-d3-ether
- m-Ethyltoluene
- N,N-Dimethylformamide
- Naphthalene
- Natural gas
- n-Butanol
- n-Butyl Disulfide
- n-Butyl disulfide
- n-Butyl mercaptan
- n-Butyl methacrylate
- n-Butyl sulfide
- n-Butylacetate
- n-Decylcyclohexane
- n-Decylcyclopentane
- n-Dodecyl alcohol
- n-Dodecylcyclohexane
- n-Dodecylcyclopentane
- n-Eicosylcyclohexane
- n-Eicosylcyclopentane
- N-Formylmorpholine
- n-Heptadecane
- n-Heptadecylcyclohexane
- n-Heptadecylcyclopentane

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Multicomponent Mixes

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- n-Heptane
- n-Heptylcyclohexane
- n-Heptylcyclopentane
- n-Hexadecylcyclohexane
- n-Hexadecylcyclopentane
- n-Hexaldehyde
- n-Hexane
- n-Hexanol
- n-Hexylcyclopentane
- n-Hexylcylcohexane
- Nitroethane
- Nitromethane
- Nitrosyl chloride
- n-Nonadecylcyclohexane
- n-Nonanonic acid
- n-Nonyl alcohol
- n-Nonyl aldehyde
- n-Nonylcyclohexane
- n-Nonylcyclopentane
- n-Nonyldecylcyclopentane
- n-Octadecane
- n-Octadecylcyclohexane
- n-Octadecylcyclopentane
- n-Octanol
- n-Octylcyclohexane
- n-Octylcyclopentane
- Nonacosane
- Nonadecane
- n-Pentadecylcyclohexane
- n-Pentadecylcyclopentane
- n-Pentane
- n-Pentylbenzene
- n-Pentylcyclohexane
- n-Pentylcyclopentane
- n-Propyl benzene
- n-Propyl Disulfide
- n-Propyl Mercaptan
- n-Propyl nitrate
- n-Propyl Sulfide
- n-Tetradecyl alcohol
- n-Tetradecylcyclohexane
- n-Tetradecylcyclopentane
- n-Tridecylcyclohexane
- n-Tridecylcyclopentane
- n-Undecylcyclohexane
- n-Undecylcyclopentane
- o-Cresol
- Octacosane
- o-Dichlorobenzene-d4
- o-Diethylbenzene
- o-Ethyltoluene
- Oxygen
- p-Chlorotoluene
- p-Cresol
- p-Diethylbenzene
- Pentacosane
- Pentafluoroethane
- Perfluoro (methyl vinyl ether)
- Perfluoro-2-butene (Mixed Isomers)
- Perfluorobutane
- Perfluoropropyl vinyl ether
- p-Ethyltoluene
- Phenol
- Phenyl ether
- Phenyl isocyanate
- Phenyl mercaptan
- Phenyl sulfide
- Piperylenes (Mixed Isomers)
- Propadiene
- Propane
- Propionic acid
- Propionitrile
- Propyl disulfide
- Propyl sulfide
- Propylamine
- Propylcyclohexane
- Propylcyclopentane
- Propylene
- Propylene glycol
- Propylene oxide
- sec-Butlycyclohexane
- sec-Butyl ether
- sec-Butyl Mercaptan
- sec-Butyl methyl ether
- sec-Butyl Sulfide
- sec-Butylbenzene
- sec-Phenethyl alcohol
- Squalane
- Sulfur
- Sulfur dioxide
- Sulfur trioxide
- tert-Amyl methyl ether
- tert-Butyl alcohol
- tert-Butyl disulfide
- tert-Butyl mercaptan
- tert-Butyl Sulfide
- tert-Butylbenzene
- tert-Butylcatechol
- tert-Butylcyclohexane
- Tetracontane
- Tetracosane
- Tetrafluoromethane
- Tetrahydrofuran
- Tetrahydrothiophene
- Tetramethylene sulfone
- Tetratetracontane
- Tetratriacontane
- Thianaphthene
- Thiophene (Thiofuran)
- Toluene
- trans-1,2-Dichloroethylene
- trans-1,2-Dimethylcyclohexane
- trans-1,2-Dimethylcyclopentane
- trans-1,2-Dimethylcyclopropane
- trans-1,3-Dichloro-1-propene
- trans-1,3-Dimethylcyclohexane
- trans-1,3-Dimethylcyclopentane
- trans-1,3-Pentadiene
- trans-1,4-Dimethylcyclohexane
- trans-1-Methyl-2-ethylcyclopentane
- trans-1-Methyl-3-ethylcyclopentane
- trans-2-Butene
- trans-2-Heptene
- trans-2-Hexene
- trans-2-Methyl-3-hexene
- trans-2-Octene
- trans-3,4-Dimethyl-2-pentene
- trans-3-Heptene
- trans-3-Methyl-2-hexene
- trans-3-Methyl-2-pentene
- trans-3-Methyl-3-hexene
- trans-3-Octene
- trans-4,4-Dimethyl-2-pentene
- trans-4-Methyl-2-pentene
- trans-4-Octene
- trans-5-Methyl-2-hexene
- trans-Decahydronaphthalene
- trans-Penten-3-yne-1
- Triacontane
- Tricosane
- Tridecyl alcohol
- Triethylamine
- Triisobutylene
- Trimethylamine
- Vinyl acetylene
- Vinyl chloride
- Vinyl fluoride
- Vinyl methyl ether
- Xylenes (Mixed Isomers)

α-Diisobutylene
α-Farnesene
α-Methylstyrene
α-Pinene
β-Diisobutylene

PRAXAIR
Making our planet more productive

Extensive Distribution Network

Through a robust network of hundreds of supply points served by dozens of gas plants, Praxair provides reliable delivery of gases, supply systems, advanced process and applications technologies, and other services that deliver exceptional value to the natural gas industry.

Pure specialty and industrial grade gases are available in high pressure or ultra high pressure cylinders, multi-packs or tube trailers to meet any requirement.

Refer to Section A – Cylinders and Containers for details.

Typical Natural Gas Reference Standards

Component Concentration (Mol %)	GPA** Gas Reference	High Helium Reference	Danalyzer™ Mixture	C7+ Natural Gas Mixture	Sour Natural Gas Mixture	Extended Natural Gas Mixture	Natural Gas Mixture	Pipeline Natural Gas Mixture	High Ethane Gas Mixture
Argon	–	–	–	–	0.4	0.37500	–	–	–
n-Butane	3.0	1.0	0.3	0.3	0.3	0.30000	0-5.0	0.10	3.00
Carbon Dioxide	1.0	0.3	1.0	1.0	1.0	1.00000	0-25.0	0.60	0.50
n-Decane	–	–	–	–	–	0.00018	*	–	–
n-Dodecane	–	–	–	–	–	0.00005	*	–	–
Ethane	9.0	3.0	5.0	4.6	6.0	6.00000	0-10.0	4.0	12.50
Helium	0.5	2.0	–	–	0.5	0.50000	–	–	–
n-Heptane	–	–	–	0.03	0.02	0.00075	*	–	–
n-Hexane	–	–	0.03	0.05	0.05	0.02300	*	–	–
Hydrogen Sulfide	–	–	–	–	1.0	–	0-25.0	–	–
Isobutane	3.0	1.0	0.3	0.3	0.3	0.30000	0-5.0	–	3.00
Isopentane	1.0	0.3	0.1	0.1	0.1	0.10000	0-1.0	0.03	0.50
Methane	70.5 (Balance)	88.7 (Balance)	89.57 (Balance)	90.0 (Balance)	87.12 (Balance)	86.99999 (Balance)	70-90 (Balance)	94 (Balance)	64 (Balance)
Methyl Mercaptan	–	–	–	–	–	–	–	4 ppm	–
Nitrogen	5.0	1.6	2.5	2.5	2.0	3.00000	–	0.60%	9.00
n-Nonane	–	–	–	0.004	–	0.00018	–	–	–
n-Octane	–	–	–	0.016	0.01	0.00075	–	–	–
Propane	6.0	1.8	1.0	1.0	1.0	1.30000	0-6.0	0.40	7.0
n-Pentane	1.0	0.3	0.1	0.1	0.1	0.10000	0-1.0	0.02	0.50
Neopentane	–	–	0.1	–	0.1	–	–	–	–
n-Tridecane	–	–	–	–	–	0.00005	*	–	–
n-Undecane	–	–	–	–	–	0.00005	*	–	–

* C6+: As specified by enduser (Dewpoint restrictions may apply, All concentrations must add up to 100%).
** Gas Processors Association

Praxair provides a wide range of mixtures with either overall mixture accuracy or component uncertainty.

Praxair's full line of environmental products support compliance and regulatory needs of the natural gas industry. See page D•162 for a complete listing of grades and specifications.

The 2002 Series regulators are designed for primary pressure control of non-corrosive, high-purity or liquefied gases. It is useful for applications where minor fluctuations in outlet pressure due to diminishing inlet supply pressure can be tolerated.

Part number PRS20022731-510. See page E•257 for options and detailed specifications.

2002 Series Regulator

Pure Organic Products

The Pure Gases section (see pages B•21 to B•88), includes a wide range of pure organic products. Praxair's extensive supplier network provides access to a wide range of raw materials. These raw materials often have more stringent specifications than other commercially available materials. In-house proprietary purification is also used in cases where higher specifications are required.

High Purity Organics

Chemical	Grade	Quality	Page Number
1, 3 Butadiene	2.5	99.5%	B•30
n-Butane	3.0	99.9%	B•31
Ethylene	5.0	99.999%	B•42
Isobutane	4.0	99.99%	B•58
Isobutylene	3.0	99.9%	B•59
Methane	5.0	99.999%	B•61
Propane	4.0	99.99%	B•72
Propylene	2.8	99.8%	B•73

Petrochemical Mixtures

Praxair provides a wide range of mixtures for both process control and product quality QA/QC. The products meet ASTM 2163 and/or GPA standard 2140.

LPG Reference Standards

Component	Propane	Isopentane	n-Pentane	Propylene	Propane/ Propylene	Butane
1-3, Butadiene	3.0%	–	–	20 ppm	–	–
2,2-Dimethylbutane	–	–	2.0%	–	–	–
2,3-Dimethylbutane	–	–	1.0%	–	–	–
Benzene	–	–	1.0%	–	–	–
n-Butane	3.0%	4.0%	–	40 ppm	0.1-1%	30-64%
cis-2-Butene	3.0%	0.1%	–	50 ppm	–	–
trans-2-Butene	3.0%	0.1%	–	30 ppm	–	–
Carbon Monoxide	–	–	–	–	–	–
Cyclohexane	–	–	2.0%	–	–	–
Cyclopentane	–	–	2.0%	–	–	–
Ethane	3.0%	–	–	–	0.1-4%	0-2%
Ethylene	3.0%	–	–	–	–	–
n-Hexane	–	–	2.0%	–	–	–
Isobutane	5.0%	0.6%	–	60 ppm	1-3%	15-25%
Isobutylene	–	–	–	40 ppm	1-3%	0-6%
Isopentane	–	95.0% (Bal)	5.0%	–	0-1%	0-2%
Isoprene	–	0.2%	–	–	–	–
Methane	1.0%	–	–	–	–	–
Methyl Cyclopentane	–	–	1.0%	–	–	–
2-Methylpentane	–	–	2.0%	–	–	–
3-Methylpentane	1.0%	–	1.0%	–	–	–
n-Pentane	5.0%	–	81.0% (Bal)	–	–	–
Propane	70.0% (Bal)	–	–	–	4-94%	3-45%
Propylene	–	–	–	99.97% (Bal)	4-95%	0-6%

Technical Support

A highly trained team of field sales representatives, technical support personnel and production chemists provides the guidance and support needed to resolve regulatory, technical and safety issues.

For technical support, call the North America Technical Support Center at 1-877-PRAXAIR

Liquid Containers

Praxair offers liquid mixtures in aluminum cylinders (4L, 2L, 1L, 500ml, 250ml). These containers are effective in maintaining the integrity of complex matrices over extended periods. We continually look for new packaging techniques to enhance our hydrocarbon products. Please call us with your special packaging requests.

Welker® Piston Cylinders

Available in 250cc – 1000cc these highly specialized containers which have working pressures of 2000 psi.

PRAXAIR
Making our planet more productive

Highly Reactive Volatile Organic Compounds (HRVOC) Standards

Praxair provides a variety of standards used in Highly Reactive Volatile Organic Compounds testing of environmental conditions. The most common products and ranges are listed below. Please inquire if you have special requirements which are not listed.

Highly Reactive Volatile Organic Compound (HROC) testing of vents, flares, cooling towers and fugitive emissions requires calibrations standards used by the equipment which verifies air quality and composition. In addition to the most common analytes of Ethylene, Propylene, 1,3 butadiene and butene, other products and concentration ranges are available and listed. Please inquire if you have special requirements which are not listed.

Typical Components	Concentration Range	Nitrogen Matrix	Methane Matrix	Helium Matrix	Hydrogen Matrix
Methane	3 ppm-Balance Gas	4-60 ppm	Balance	–	–
Ethane	3 ppm-12%	4-60 ppm	–	–	10 ppm-20%
Ethylene	3 ppm-12%	4-60 ppm	4-12%	3-160 ppm	10 ppm-10%
Acetylene	3-8000 ppm	–	–	3-160 ppm	–
Propane	3-8000 ppm	4-60 ppm	–	3-160 ppm	10 ppm-1%
Propylene	3-8000 ppm	–	4-3000 ppm	3-160 ppm	10 ppm-1%
Isobutane	3-8000 ppm	4-60 ppm	–	–	10-1000 ppm
n-Butane	3-8000 ppm	4-60 ppm	–	–	10-1000 ppm
trans-2-Butene	3-8000 ppm	–	4-5500 ppm	3-160 ppm	–
cis-2-Butene	3-8000 ppm	–	4-5500 ppm	3-160 ppm	–
1-Butene	3-8000 ppm	–	–	3-160 ppm	10-1000 ppm
isoButylene	3-8000 ppm	–	4-3000 ppm	3-160 ppm	–
isoPentane	3-8000 ppm	–	–	–	–
n-Pentane	3-8000 ppm	4-400 ppm	–	–	–
1,3 Butadine	3-8000 ppm	–	10-5500 ppm	3-160 ppm	10-1000 ppm
Hydrogen	0-Balance Gas	–	1-10%	–	Balance
Nitrogen	0-Balance Gas	Balance	0.5-12%	–	–
Helium	0-Balance Gas	–	–	Balance	–

Ultra Low Sulfur Diesel Fuel and Gasoline Standards

Recognizing the global trend to reduce sulfur levels in fuels to meet recommended guidelines established by the World Wide Fuel Charter, Praxair can provide sulfur standards customized to meet your requirements. Praxair offers stable high quality standards for your fuel calibration needs. Please inquire if you have special requirements which are not listed.

Total or speciated sulfur and nitrogen available for liquid and gas phase blends.

Total Sulfur in Diesel Fuel could be ordered as Dibenzothiophene, Thiophene, Hydrogen Sulfide or n-Butyl Sulfide. The most common ranges are listed below but other ranges are also available.

All liquid cylinders will contain an inert pressure pad based on the customer's specifications of either Nitrogen or Helium. The pressure and the volume of the pressure pad will vary depending on the cylinder size required for the mixture.

Component	Dibenzothiophene	Thiophene	Hydrogen Sulfide	n-Butyl Sulfide
Total Sulfur as	1-30 ppm	1-25 ppm	1-10 ppm	1-300 ppm
Diesel Fuel	Balance Gas	Balance Gas	Balance Gas	Balance Gas

Total Sulfur in Gasoline may be ordered as Benzothiophene, Dimethyl Sulfide, Hydrogen Sulfide or n-Butyl Sulfide. Sulfur Standards in a gasoline matrix may be ordered as either isoOctane or a blend of Toluene and isoOctane.

The most common ranges are listed below but other ranges are also available. All liquid cylinders will contain an inert pressure pad based on the customer's specifications of either Nitrogen or Helium. The pressure and the volume of the pressure pad will vary depending on the cylinder size required for the mixture.

Component	Benzothiophene	Dimethyl Sulfide	Hydrogen Sulfide	n-Butyl Sulfide
Total Sulfur as	1-30 ppm	1-50 ppm	1-10 ppm	1-150 ppm
Gasoline	Balance Gas	Balance Gas	Balance Gas	Balance Gas