BHORUKA
SPECIALTY GASES

SOL GROUP

World-Class Manufacturer of
Specialty, Rare, Industrial
and Liquid Gases

Bhoruka Group, a dynamic conglomerate, has been a leader across multiple industries for over five decades. Founded by the visionary philanthropist Mr. P.D. Agarwal, the group operates in diverse sectors including steel, industrial gases, IT parks, coal mining, renewable energy, education, and community welfare. Headquartered in Bangalore, India, Bhoruka continues its legacy under the leadership of Mr. S.N. Agarwal.

One of its key entities, **Bhoruka Specialty Gases** (formerly Bhuruka Gases Ltd.), established in 1974, is a leading manufacturer of specialty & calibration gases for industries such as Oil & Gas, solar, Semiconductor, aerospace, healthcare, electronics, and more. The company is committed to innovation, quality, and environmental sustainability, with all operations powered by renewable energy.

A strategic partnership with SOL S.p.A.

Since 2022 Bhoruka Specialty Gases is part of SOL Group, a leading industrial and medical gas manufacturer present in more than 32 countries. This strategic partnership enhances our capabilities, allowing us to serve you with an expanded range of specialty gases and a global supply chain.

SOLGROUP
a breath of life

Celebrating 50 years,

Bhoruka Specialty Gases continues to contribute to India's self-reliance by producing high-quality, import-substitute products.

Industries **We Serve**

Bhoruka Specialty Gases stands as a leading provider of an extensive array of gases, catering to the diverse needs of various industries. Our comprehensive range of gases is meticulously formulated and manufactured to meet the exacting standards of each sector we serve.

- Light Industry
- Petrochemicals
- Pollution Control
- Automobile Industry
- Aeronautical
- Space Research
- Cement Industry
- Atomic Centre
- Metallurgical
- Welding Industry
- Refineries
- Medical Equipment
- Electronics
- Gas Industries
- Hospitals
- Electrical Industry
- Power Generation
- Emission Testing
- Food industry
- Nuclear stations
- Educational Institutions
- Fertilizers

Calibration Gas

Bhoruka offers certified calibration gas standards, known for their reliability, accuracy, and traceability, ideal for demanding analytical applications like process analysers & GCs in various application industries. These multi-component gas mixtures are available in a wide range of concentrations, including ppb levels, and come with a Certificate of Analysis (COA) from Bhoruka's certified lab.

Key Features:

- Prepared using ISO 6142 standards and analysed with ISO 6143 methods.
- Traceable to NIST/NPL standards.
- High accuracy gravimetric balances used in preparation.
- Short lead times for delivery.

Cylinder Capacities

Sr. No.	Cylinder Water Capacity (Liters)	MOC	Maximum Working Pressure (Bar)	Gas Volume @ Max Working Pressure (m3)	Suitable Applications	Cylinder Valves
1	50	Steel	200	10	Non reactive gases	All types of CGA, BS4 & DIN valves can be supplied.
2	50	Aluminium	200	10	Toxic & Reactive	
2	47	Steel	150	7	Non reactive gases	
3	35	Aluminium	150	5	Toxic & reactive	
4	20	Aluminium	150	3	Toxic & reactive	
5	10	Aluminium	150	1.5	Toxic & reactive	
6	10	Steel	150	1.5	Non reactive	
7	3	Steel	150	0.45	Non reactive	
8	3	Aluminium	150	0.45	Reactive	
Note: Actual filling pressure will always be lesser than max working pressures						

Type of Calibration Gases based on Applications

1 Refinery & Petrochemicals – Calibration Gas Standards

- Sulphur Components Matrix Calibration Gas standards
- Natural Gas Standards
- Natural Gas standards -Liquified gas phase in
- Constant Pressure-Piston type Cylinder
- Calibration Gas Standards for Refinery Gas Analysers
- (RGA)
- LPG gas & Liquified Gas standards
- Methanizer Calibration Gas Standards
- Gas or liquid blends of C1/C2/C3C4/C5+ components
- Liquid blends of BTEX, other aromatics & higher Alkanes (mol/mol , vol/vol & wt/wt)
- Calibration gas and liquid blends for impurity profile in 1,3–Butadiene, 1-Butene, Propylene, Propane, Ethylene & Ethane
- Other customized liquid blends for Sulphur in hydrocarbons available in Helium over pressure cylinder or constant pressure piston type sampling cylinders
  - o Sulphur as Thiophene or Mercaptans in iso-Octane
  - o Sulphur in Butanes, Propane, Ethylene/Propylene

2 Calibration Gas for Emission & Air Quality Monitoring - CEMS, AAQMS, Automotive ExhaustGas Analyzer

Calibration Gases for Continuous Emission , Automotive Exhaust & Air Quality Monitoring Systems	
Nitric Oxide - NO (5 ppm to 5000 ppm)*	Methane – CH4 (5 ppm to 5000 ppm)
Sulphur Dioxide – SO2 (5 ppm to 5000 ppm)*	Mix of NO, SO2, CO, CH4 & CO2
Carbon Monoxide - CO (5 ppm to 5000 ppm)*	Mix of Methane / Propane (5 to 5000 ppm)
Carbon Dioxide – CO2 (5 ppm to 20 %)	Ammonia – NH3 (5 to 100 ppm)
Mix of NO, SO2, CO & CO2	BTEX mix (100 ppb to 5 ppm)*
Oxygen – O2 (0.4 % to 25 %)	

*"SOL is accredited under ISO 17034 being a reference material producer for these type of mixtures"**

3 Calibration Gas Standards for Carbon Dioxide Quality Check (CDQC) Analysers & Gcs

- Sulphur trace impurities in CO2 / Nitrogen Standard
- Oxygenates and Aromatics impurities Standard
- Hydrocarbons in CO2 / Nitrogen

4 Calibration Gas Standards for Dissolved gas analysis in Transformer oil

5 Calibration Gas standards for Mudlogging Analysis

6 Inergen Gas Mixture for Fire Supression

7 Customized Gas mixtures and Calibration Gases

Portable & Disposable Calibration Gas - Calisnap

Portable & Disposable Calibration Gas

- Four Gas mix (H2S/CO/HCs/O2)
- LEL Hydrocarbons
- Single H2S in N2 & Air
- Other Single Gas Components
- Ethanol in N2

- Cylinders Range

Sr. No.	Gas Vol	Water Capacity	Filling Pressure
1	112L	1.6L	1000 PSI
2	58L	1.6L	500 PSI
3	34L	1.0L	500 PSI
4	34L	0.5L	1000 PSI
6	17L	1.0L	250 PSI

Calisnap

17 L | 34 L | 58 L | 112 L

- Flow Regulators : Maximum Inlet Pressure: 1200 PSI

Sr. No.	Description	MOC	Flow Rate	Inlet Connection	Outlet Connection
1	Fixed Flow Regulator	Brass-Ni Plated	0.3/0.5/1.0/1.5/2/3	C10	3/16" Barb
2	Fixed Flow Regulator	SS	0.3/0.5/1.0/1.5/2/3	C10	3/16" Barb
3	Fixed Flow Regulator	Brass-Ni Plated	0.3/0.5/1.0/1.5/2/3	CGA600	3/16" Barb
4	Demand Flow Regulator	Brass-Ni Plated	0 to 3 LPM	C10	3/16" Barb

Portable & Disposable Calibration Gas - Typical Gas mixtures

Typical Gas mixtures	Capacities (GAS Vol in L)		
25PPM H2S/100PPM CO/2.5% CH4/18% O2/N2	112	58	34
25PPM H2S/100PPM CO/2.5% CH4/20.9% O2/N2	112	58	34
25PPM H2S/50PPM CO/2.5% CH4/12% O2/N2	112	58	34
20PPM H2S/60PPM CO/1.45% CH4/15% O2/N2	112	58	34
25PPM H2S/100PPM CO/2.5% CH4/17% O2/N2	112	58	34
25PPM H2S/100PPM CO/2.5% CH4/19% O2/N2	112	58	34
25PPM H2S/50PPM CO/2.5% CH4/18% O2/N2	112	58	34
25PPM H2S/50PPM CO/2.5% CH4/19% O2/N2	112	58	34
25PPM H2S/50PPM CO/2.5% CH4/20.9% O2/N2	112	58	34
10PPM H2S/50PPM CO/2.5% CH4/18% O2/N2	112	58	34
25PPM H2S/50PPM CO/0.9% I-C4H10/12% O2/N2	112	58	34
20PPM H2S/50PPM CO/0.9% I-C4H10/16% O2/N2	112	58	34
20PPM H2S/50PPM CO/0.9% I-C4H10/18% O2/N2	112	58	34
20PPM H2S/ 60PPM CO/ 1.45% CH4/ 15% O2/N2	112	58	34
10PPM H2S/ 60PPM CO/ 1.45% CH4/ 15% O2/N2	112	58	34
5 /10/15/20/25/40/50/60/100/200/250 ppm H2S /N2	112	58	34
5 /10/15/20/25/40/50/60/100/200/250 ppm H2S /AIR	112	58	34
5 /10/15/20/25/40/50/60/100/200/250 ppm NO /N2	112	58	34

Typical Gas mixtures	Capacities (GAS Vol in L)		
5 /10/15/20/25/40/50/60/100/200/250 ppm NO2 /N2 or Air	112	58	34
5 /10/15/20/25/40/50/60/100/200/250 ppm SO2/N2 or Air	112	58	34
10%LEL /20% LEL/25%LE /50% LEL METHANE (CH4) Bal AIR	112	58	34
50% /60% /100% LEL METHANE (CH4) Bal N2	112	58	34
10%LEL /20% LEL/25%LEL /50% LEL Propane (C3H8) Bal AIR	112	58	34
10%LEL /20% LEL/25%LEL /50% LEL Hydrogen (H2) Bal AIR	112	58	34
25%LEL /50% LEL i-Butane (i-C4H10) Bal AIR	112	58	34
25%LEL /50% LEL Pentane (C5H12) Bal AIR	112	58	34
50% LEL Ethylene (C2H4) Bal AIR	112	58	34
50% LEL Ethane (C2H6) Bal AIR	112	58	34
Oxygen (O2) 5 ppmv to 21 % Bal N2	112	58	34
Carbon Dioxide (CO2) Bal N2 100 ppm/ 300 ppm /1%/ 2 %/5% / 10% /12% / 15%/20% CO2 Bal N2	112	58	34
iso-Butane (C4H10) Bal N2 8% /10% /12% iso-Butane Bal N2	-	-	17
Methane (CH4) Bal N2 8% /10% /12% /15%/20%/30% Methane Bal N2	112	58	34
Carbon Monoxide (CO) 5 to 5000 ppm CO Bal AIR or N2	112	58	34
Iso-Butylene (iso-C4H8) 5 to 500 ppm Bal Air	112	58	34
Hydrogen (H2) Bal AIR 5 ppm/10 ppm/20 ppm/25/ppm/50 ppm/100 ppm/500 ppm H2 Bal AIR	112	58	34
Ethanol (C2H5OH) Single Gas Mixtures 10ppm/ 104.2 ppm/120.2 ppm/ 125ppm/138.5ppm Ethanol (C2H5OH) Bal N2	112	58	34
5ppm/ 10ppm/ 20ppm/ 50 ppm /100 ppm Ammonia (NH3) Bal N2	112	58	34

Applications

Marine Vessels

Oil & Gas

Fixed and Portable gas detectors

Alcohol Meters

Specialty Gases for Semiconductor Manufacturing

- Ultra-High Purity & consistency
- Various packaging sizes
- Environmental Responsibility

Special Gases for Deposition

- Ammonia (NH3)
- Nitrous oxide (N2O)
- Dichlorosilane (SiH2Cl2)
- Oxygen
- Silane (SiH4)
- Nitric oxide (NO)

Special Gases for Etching

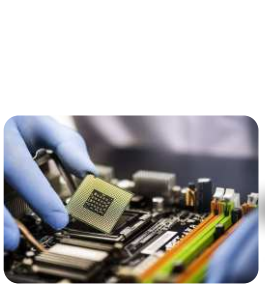
- Boron trichloride (BCl3)
- Carbon dioxide (CO2)
- Carbon monoxide (CO)
- Chlorine (Cl2)
- Nitrogen trifluoride (NF3)
- Sulfur hexafluoride (SF6)
- Trifluoromethane (CHF3)
- Tetrafluoromethane (CF4)

Specialty Gases for Doping

- Germanium in Hydrogen
- Phosphine (PH3) in Hydrogen
- Diborane (B2H6) in Hydrogen
- Tetraethyl orthosilicate

Other Gases

Nitrogen	99.9999%
Hydrogen	99.9999%
Helium	99.9999%
Hydrogen Sulphide	99.5%
Argon	99.9999%



Specialty & Calibration Gases for Renewable Energy

Calibration Gas

- BioMethane Calibration Gas
- Hydrogen Enriched Fuel Gas Standards
- BioLNG Calibration Gas
- Biogas Analyzer Standard

Special Gases for Solar Cell Manufacturing

GAS	PURITY	PACKAGING SIZE
Silane (SiH4)	99.9999 %	Tube Trailer
Ammonia (NH3)	99.9999 %	ISO Tank
Nitrous Oxide (N2O)	99.9999 %	Tube Trailer
Trimethyl Aluminium	-	300 Ltr Canister
Methane (CH4)	99.999 %	50L Cylinders
Hydrogen (H2)	99.9999 %	50L Cylinders
Phosphine in H2	-	Y Tonner
Argon (Ar)	99.9999 %	50L Cylinders
Boron Trichloride (BCL3)	99.999 %	Tonner
Oxygen (O2)	99.9995 %	50 L Cylinders

Methane Plant

Bhoruka Specialty Gases has recently installed two state-of-the-art high-purity methane plants, reflecting its commitment to industry-leading standards. The Harohally plant achieves an impressive purity level of 99.9998%, while the Indapur plant has been upgraded to deliver Grade 6 methane,showcasing the latest technological advancements.

Bhoruka offers reliable supply solutions for high-purity methane, available as liquid in Iso tanks and road tankers, or compressed in pallets and cylinders, catering to diverse industrial needs with a focus on quality and precision.

Purity & impurities Table

Purity	Impurities				
Methane	Nitrogen	Oxygen	Hydrocarbons	Moisture	Total Impurities
99.9999	<0.3 ppm	<0.3 ppm	<0.2 ppm	<0.2 ppm	<=1.0 ppm
99.9998 %	<1.5 ppm	<0.5 ppm	<0.1 ppm	<1.0 ppm	<2.0 ppm
99.9995%	<3.0 ppm	<1.0 ppm	<1.0ppm	<1.0 ppm	<5.0 ppm
99.999%	<5.0 ppm	<2.0 ppm	<5.0 ppm	< 2.0 ppm	<10 ppm
99.995%	<20 ppm	<5.0 ppm	<25 ppm	<2.0 ppm	<50 ppm
99.97%	<100 ppm	<10 ppm	<250 ppm	<5.0 ppm	<300 ppm
99.5%	<2000 ppm	<50 ppm	<2500 ppm	<10 ppm	<5000 ppm

Hydrocarbon Refrigerant gases

Bhoruka has introduced a cutting-edge Hydrocarbon Refrigeration Plant, utilizing the hot distillation method to produce high-purity, eco-friendly refrigerants like R290 (Propane), R600a (Isobutane), and R600 (N-Butane). This innovative process ensures superior separation and efficiency, positioning Bhoruka as a leader in sustainable, energy-efficient refrigeration solutions

Specifications

Grade	99.5%	99.95%	99.99%	99.999%
	N2.5	N3.5	N4.0	N5.0
Propane	✓	✓	✓	✓
Iso-butane	✓	✓		
n-Butane	✓			
Propylene	✓		✓	

Refrigerant Gases- Others

1. CF4 – 99.999% (R-14)
2. C4F8 – 99.999% (R-C318)
3. SF6 – 99.999%

Hydrogen Plant

Bhoruka produces green hydrogen through water electrolysis, utilizing wind energy to power the process, making it sustainable and carbon-neutral. The hydrogen is then cryogenically purified to achieve an exceptional purity level of 99.9999%, ensuring the highest quality.

Applications of Hydrogen Gas:

- Used in sintering and annealing processes to create high-density components andimprove metal ductility.
- Serves as a reducing agent for metal oxides.
- Provides a protective atmosphere in high-temperature processes.
- Utilized in chemical vapor deposition (CVD) and hydrogen furnaces for high-purity materials.
- Important in additive manufacturing for producing high-performance materials.
- Essential for manufacturing flexible metal hoses for transportation.
- Used in expansion joints for pipelines and metal bellows for pressure compensation in high-pressure systems.

Purity & impurities Table

Purity	Impurities					
Hydrogen	Nitrogen	Oxygen	CO+CO2	Hydrocarbons	Moisture	Total Impurities
99.9999 %	<0.5 ppm	<0.5 ppm	<0.1 ppm	<0.5 ppm	<0.1 ppm	<2.0 ppm
99.9995%	<2.0 ppm	<1.0 ppm	<0.5 ppm	<1.0ppm	<0.2 ppm	<5.0 ppm
99.999%	<5.0 ppm	<2.0 ppm	<0.5 ppm	<2.0 ppm	< 0.2 ppm	<10 ppm

Oxygen Plant

Bhoruka produces oxygen with a purity level of 99.9995% through water electrolysis, a process that separates oxygen and hydrogen gases. To achieve ultra-purity, the oxygen undergoes additional cryogenic distillation. This high-purity liquid oxygen is essential for applications sensitive to trace impurities, and it is utilized in various fields, including solar energy, semiconductor manufacturing, and research and development (R&D).

Purity & impurities Table

Purity	Impurities					
Oxygen	Nitrogen	Argon	CO+CO2	Hydrocarbons	Moisture	Total Impurities
99.9995 %	<0.3 ppm	<0.1 ppm	<0.5 ppm	<0.1 ppm	<0.1 ppm	<5.0 ppm
99.999%	< 8 ppm		<0.5 ppm	<0.1ppm	<2.0 ppm	<10.0 ppm
99.99%	<95 ppm		<2.5 ppm	<0.2 ppm	<2.0 ppm	<100 ppm

Helium Plant

Bhoruka has unveiled its Customized Helium Purification Plant, designed to achieve Grade 6 purity levels of helium using advanced cryogenic methods. As a leader in engineering, Bhoruka enhances HELIUM purification standards, benefiting industries like healthcare, electronics, and aerospace, while maintaining a strong commitment to precision and quality.

Purity	Impurities					
Helium	Nitrogen	Oxygen	CO+CO2	Hydrocarbons	Moisture	Total Impurities
99.9999 %	<0.5 ppm	<0.5 ppm	<0.1 ppm	<0.1 ppm	<0.5 ppm	<=1.0 ppm
99.999%	<4.0 ppm	<4.0	<0.2 ppm	<0.1ppm	<1.0 ppm	<10.0 ppm
99.9995%	<2.0 ppm	<2.0	<0.1 ppm	<0.1ppm	<<1.0 ppm	<= 5.0 ppm

Argon	Nitrogen		
Grade	5.0	5.7	6.0
Purity	99.999%	99.9997%	99.9999%

Carbon Dioxide

Bhoruka is launching a Continuous Distillation-Based Carbon Dioxide Purification Plant in India, aiming to efficiently purify CO2 at 99.999% purity. This initiative supports sustainable practices, reduces greenhouse gas emissions, and meets the increasing demand for high-purity CO2 in various industries.

Grade & Purity

Grade	5.0	4.5	3.0
Purity	99.999%	99.995%	99.9%

Ammonia Plant

Bhoruka is thrilled to announce a ground-breaking initiative to enhance its capabilities in AMMONIA purification at its facility near Pune, Maharashtra, India. This strategic move involves the installation of a state-of-the-art continuous distillation system, aiming to elevate product purity to an exceptional 99.9999% and annual production capacity of 1700 tons

SS Pressure Regulators – Single & Double Stage

- Cylinder pressure delivery regulator
- 6 ports flexible configuration
- Stable outlet pressure
- Inbuilt Inlet filter
- Outlet pressure regulation by hand wheel
- Stainless steel 316/316L body and bonnet for corrosive and toxic gases
- Brass chrome plated body and bonnet for non-corrosive gases and mixtures up to grade 6.0

Type:	Double-stage
Inlet pressure P1	max. 280 bar
Outlet pressure P2	2/4/10/20 bar
Materials body regulator relief valve	see ordering info
Valve seat	PTFE
Diaphragm	SS316/Hastelloy
Filter	SS 316L
Inlets and outlets port	1/4" NPT(F)
Temperature range	-300C to +740C
Flow capacity	Cv = 0.06
Weight	2.0 kg

Cylinder Trolleys

We are offering Double Cylinder Trolleys for the cumbersome big cylinders as well as small cylinders. These trolleys are scratch resistant, have a high gloss and electrostatically applied oven baked powder coating. Double Cylinder Trolleys offered by us are manufactured to hold and easily transport heavy compressed gas cylinders and they have arc welded tubular steel construction for strength.

Double Ended High Pressure Sampling Cylinders

Part	MOC	Capacity (CC)	End Connection	Design Pressure (Bar)	Length x Dia (mm)
SC-100-4	SS 316 L	100	¼" NPT F	125	210 X 48.3
SC-300-4	SS 316 L	300	¼" NPT F	150	240 X 60.5
SC-500-4	SS 316 L	500	¼" NPT F	200	280 X 60.5
SC-500-2	SS 316 L	500	1/2" NPT F	200	280 X 60.5
SC-500-4	SS 316 L	500	¼" NPT F	350	510 X 48.5
SC-1000-4	SS 316 L	1000	¼" NPT F	350	275 X 88.9
SC-1000-2	SS 316 L	1000	1/2" NPT F	350	275 X 88.9

Our Quality Control Lab

State of the art Quality control Lab to analyse purity and impurities in gases

- DID GC
- SCD GC
- ECD GC
- TCD+FID GC
- PFPD GC
- CLD Gas Analysers for NOx
- UV-DOAS Gas Analyser for H2S
- Moisture analyzer
- Oxygen Analyzer

All the Analytical equipment are regularly calibrated using Traceable standards and PRMs.
We have PRMs from NIST and NPL for certain gases.

Plants

Methane Plant

Hydrogen Plant

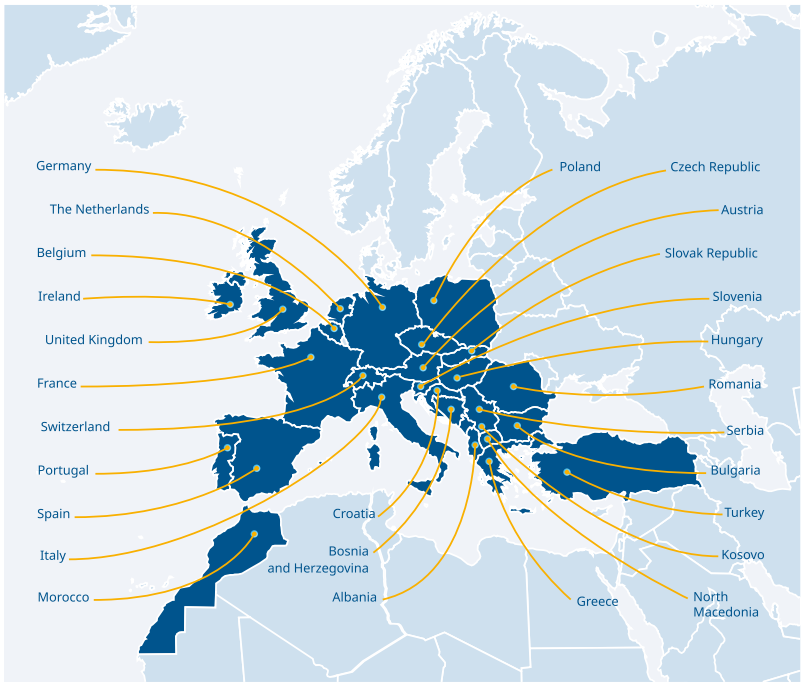
300 bar Cylinder Filling

Calibration Gas

Propane Plant

SOLGROUP
a breath of life

Global Presence



Local Plant Locations

BHORUKA SPECIALTY GASES

SOL GROUP

Bangalore Head office

Plot No. 5A & 6, Doddanekundi Industrial Area,
Whitefield Road, Mahadevapura,
Bangalore – 560 048 Karnataka, INDIA

Harohalli Plant

2nd Phase Harohalli, Kanakapura Road
Plot Nos. 206 & 207 KIADB Ind Area
Karnataka Ramanagara Dist – 562112 India

Indapur Plant (PUNE)

A 1/2, Indapura Industrial Area, Village
Loni Devkar, Indapura PUNE – 413132

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