



VADILAL CHEMICALS LTD.

202, Safal Pegasus, Opp Reliance Petrol Pump,
Prahladnagar, AHMEDABAD 380015
PHONE : +91 79 30086938 / 37 / FAX : +91 79 30086940
Email : info@vadilalgases.co.in
URL : www.vadilalgases.co.in

Calibration Gases

Stable, Accurate & Traceable
Customer oriented Solution

Vadilal Chemicals Ltd. offers over 30 years of experience developing **pure gases, specialty gases, gas mixtures and calibration gases for all types of process control and instrument calibration applications.**

Our calibration mixtures and specialty gases are distributed in refillable and non-refillable cylinders since the late 1990s and since its inception Vadilal has manufactured **more than 15,000 calibration gases** and presently manufactures more than **5,500 cylinders per year.**

We offer a complete line of products, including pure gases to levels of 99.9999% purity, **multi-component hydrocarbon gases & liquid mixtures for refineries, laboratory, environment monitoring, industrial hygiene, medical and special application mixtures for semiconductor and electronic applications.** This filling centre is dedicated for manufacturing only pure gases and mixtures; and is geared to produce high degree precision mixtures. The laboratory is **ISO 9001:2008** certified and is in the process of securing **ISO 17025:2005** certification.

Our Quality and Standard Operating Process

Precise manufacturing of calibration mixtures involves many critical steps- consideration of chemical raw material purity as well as detailed impurity characterization; calculation of phase behaviour for the calibration mixture; precise blending; traceability information; and finally, independent confirming analysis of the final calibration mixture.

1. Before starting, mixtures are first evaluated for potential phase problems (its properties)
2. Following, the mixture is precisely blended to exact specifications on high sensitivity gravimetric balances.
3. Finally, the product is analyzed using state-of-the-art analyzers to confirm that the blended and analyzed values agree with each other according to the stated product specifications.

We produce all kind of customised mixtures:-

- Simple and Complex gas mixtures of 2 to 20 components,
- Bespoke calibration gas mixtures from ppb to % concentration levels
- Gravimetrically or Analytically traceable to International Standards.
- Uncertainties from +/-1% to +/-5%
- Blending tolerances ranging up to 1% relative & Calibration uncertainties ranging up to 0,1% relative.
- Variety of cylinder sizes available, 200 bar fill pressure with British Standard (BS) valves
- Stability of gas mixtures to 1 year
- Multi-component Hydrocarbon mixtures, Toxic mixtures and corrosive gases
- Non reactive mixtures & High Purity Carrier Gases

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ISO 9001:2008



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Few example of Calibration MIXTURES for Industry

LIQUID MIXTURES

1. 50 PPM Orthoxylene (C₈H₁₀) + 50 PPM Metaxylene (C₈H₁₀) + 50 PPM Paraxylene (C₈H₁₀) + 50 PPM Ethylbenzene (C₈H₁₀) + Balance N- Decane (C₁₀H₂₂)
2. 10% Ethylbenzene (C₈H₁₀) + 20% Paraxylene (C₈H₁₀) + 22% Orthoxylene (C₈H₁₀) + BAL 50 PPM Metaxylene (C₈H₁₀)
3. 15% 1-Butene (C₄H₈) + 7% Cis-2-Butene (C₄H₈) + 0.5% Trans-2-Butene (C₄H₈) + 23% 1,3 Butadiene(C₄H₆) + Balance Benzene (C₆H₆)
4. 0.5% Propane (C₃H₈) + 0.5% Propylene (C₃H₆) + 5% Iso-Butane (C₄H₁₀) + 5% N-butane (C₄H₁₀) + 5% 1-Butene (C₄H₈) + 5% Iso-Butylene(C₄H₈) + 0.2% Propadanie (C₃H₄) + 5% Trans-2-Butene (C₄H₈) + 0.2% 1,2 Butadiene + Balance 1,3 Butadiene (C₄H₆)

NATURAL GAS MIXTURE

1. 8% Ethane (C₂H₆) + 5.6% Propane (C₃H₈) + 1.3% I-Butane (C₄H₁₀) + 1.3% N-Butane(C₄H₁₀) + 0.3% I Pentane(C₅H₁₂) + 0.3% N- Pentane (C₅H₁₂) + 0.4% N-Hexane(C₆H₁₄) + 0.3% Nitrogen (N₂) + 4% Carbon dioxide (CO₂) + Balance Methane (CH₄)
2. 7% Ethane (C₂H₆) + 2.5% Propane (C₃H₈) + 0.5% I-Butane (C₄H₁₀) + 0.1% N-Butane (C₄H₁₀) + 0.1% I Pentane (C₅H₁₂) + 0.1% N Pentane (C₅H₁₂) + 0.1% N-Hexane (C₆H₁₄) + 0.1% Nitrogen (N₂) + 5% Carbon dioxide (CO₂) + 0.0025% Hydrogen Sulfide (H₂S) + Balance Methane(CH₄)
3. 0.5% Methane (CH₄) + 0.25% Ethane (C₂H₆) + 0.25% Ethylene (C₂H₄) + 0.25% Propane (C₃H₈) + 0.5% Propadiene (C₃H₄) + 0.005% Methylacetylene (C₃H₄) + 0.5% I-Butane (C₄H₁₀) + 0.003% N-Butane (C₄H₁₀) + 0.005% Iso-Butylene(C₄H₈) + 0.005% 1-Butene (C₄H₈) + 0.005% Cis-2-Butene(C₄H₈) + 0.005% Trans-2-Butne (C₄H₈)+ 0.1% 1,3 Butadiene (C₄H₆) + Balance Propylene(C₃H₆).
4. 20% Hydrogen(H₂) + 4% Carbon Monoxide (CO) + 4% Carbon Dioxide (CO₂) + 1% Ethane(C₂H₆) + 1% Ethylene (C₂H₄) + 1% Propane(C₃H₈) + 1% Propylene(C₃H₆) + 1% Iso Butane(C₄H₁₀) + 1% N Butane(C₄H₁₀) + 1% Propadiene(C₃H₄) + 1% 1 Butene(C₄H₈) + 1% Iso Butylene (C₄H₈) + 1% Trans-2-Butene (C₄H₈) + 1% Cis-2-Butene (H₄H₈)+ 1% 1,3 Butadiene (C₄H₆)+ 1% Iso Pentane (C₅H₁₂) + 1% N Pentane(C₅H₁₂) + Balance Methane(CH₄).

MULTI COMPONANT CALIBRATION GAS MIXTURE

1. 200 PPM Ethane(C₂H₆) + 100 PPM Propylene(C₃H₆) + 200 PPM Methane(CH₄) + 50 PPM Propane(C₃H₈) + 5 PPM Acetylene(C₂H₂) + 100 PPM Propadiene(C₃H₄) + 100 PPM Trans-2-Butene(C₄H₈) + 50 PPM 1,3 Butadiene(C₄H₆) + 50 PPM 1,2 Butadiene (C₄H₆) + Balance Ethylene(C₂H₄)
2. 100 PPM Methane(CH₄) + 100 PPM Ethane(C₂H₆)+ 200 PPM Ethylene (C₂H₄) + 1% Propane(C₃H₈) + 100 PPM Methacetylene (C₃H₄) + 100 PPM Propadiene(C₃H₄) + 500 PPM Hydrogen (H₂)+ Balance Nitrogen (N₂).
3. 12% Methane (CH₄) + 12 Ethane (C₂H₆) + 24% Ethylene (C₂H₄) + 9% Acetylene (C₂H₂) + 7.5% Ethane (C₂H₆) + 6% N Butane(C₄H₁₀) + 5% Iso Butane(C₄H₁₀) + 4% N Pentane((C₅H₁₂) + 4% I Pentane(C₅H₁₂) + Balance Propylene(C₃H₆).
4. 10% Carbon Dioxide (CO₂) + 1.2% Nitrogen (N₂)+0.5% Carbon Monoxide (CO) + 0.2% Ethane(C₂H₆) + 0.2% Propane(C₃H₈)+1% I Butane (C₄H₈)+ 0.2% N Butane(C₄H₈) + 0.2% I Pentane(C₅H₁₂) +0.2% N Pentane(C₅H₁₂) +0.2% N Hexane (C₆H₁₄)+65% Methane (CH₄) + Balance Hydrogen(H₂).
5. 30 PPM Iso Butane(C₄H₁₀) + 30 PPM N Butane(C₄H₁₀) + 50 PPM 1 Butene(C₄H₈) + 50 PPM Propadaine(C₃H₄) + 50 PPM Cis-2-Butene(C₄H₈) + 50 PPM Iso Butylene(C₄H₈) + 50 PPM Trans-2-Butene (C₄H₈)+ 100 PPM 1,3 Butadiene(C₄H₆) + 250 PPM Ethane(C₂H₆) + 250 PPM Ethylene(C₂H₄) + 500 PPM Methylactylene(C₃H₄) + 500 PPM Methane(CH₄) + 0.5% Propane(C₃H₈) + Balance Propylene(C₃H₆) .

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