Specialty Gases for Oil & Gas

Where you are. Where you need to be. We are here too.
**Your needs - Our solutions**

Whether operating in quality, process control, safety detection, industrial emission monitoring or performing research and development, Air Liquide offers **complete and innovative solutions** to meet your most stringent **quality and traceability needs**.

**We understand your business and deliver valuable solutions to your specific requirements.**

- ALPHAGAZ™ pure gases for analytical applications.
- Calibration mixtures (gas and liquid phase mixtures in refillable, non-refillable & piston cylinders).
- Accredited calibration mixtures.
- Exclusive cylinder treatments to warranty stability of most difficult mixtures including very low level of sulfur components.
- Valued services such as Proficiency Testing Programs (Round Robin).
- Maintenance, training and cylinder management services.
- Gas handling equipment and installations, including high purity gas generators.

**We think global and act local:**

Established and experienced local organizations are supported by a global organization for account management, industrial proficiency, worldwide supply chain and enhanced competitiveness.
Complete range of products:
- Multicomponent hydrocarbon mixtures for use in analytical applications.
- Sulfur standards in a hydrocarbon (gas/liquid) balance.
- Natural gas reference standards.
- LPG in floating piston cylinders.
- Comprehensive inventory of hydrocarbon standards to meet demanding needs.
- Traceable gas and liquid reference standards with a fundamental link to SI-units.
- Small, large and custom packaging for corrosive, inert, flammable compressed gas products.
- Products certified under ISO 9001, ISO 17025 and ISO Guide 34 Laboratory Accreditations.
- Proficiency Testing Programs to assess accuracy of your measurements through comparison with others.

Global production capabilities:
- Air Liquide operates over 30 mixtures’ production plants that are strategically positioned across the world.
- FLOXFILL™ Specialty Gases – Air Liquide innovative and compact mixtures’ production plant for implementation within customer proximity. Standardized plant with most advanced technology in Specialty Gases mixtures’ production.
- Dedicated export organisations in USA, UK and Netherlands to deliver products to our customers anywhere around the globe.

Lead time reliability:
- Manufacturing within our customers’ proximity.
- Most advanced production tools in all geographies.
- Dedicated organizations for Specialty Gases.
**ALPHAGAZ™** is our Pure Gases product range, successfully launched worldwide, dedicated for laboratory and analysis. In addition to perfect gas, Air Liquide is now adding a **new ergonomic valve** on the top of the cylinder, to offer improved safety and simplicity of use.

**ALPHAGAZ™**

Product range that meets the needs of analytical applications:

- Guaranteed low critical impurity levels.
- Two levels of purity:
  - **ALPHAGAZ™ 1**, for the accuracy of analysis from % to ppm,
  - **ALPHAGAZ™ 2**, for the high accuracy of analysis from ppm to ppb.

<table>
<thead>
<tr>
<th>ALPHAGAZ™ 1</th>
<th>ALPHAGAZ™ 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifications</td>
<td>Ar, H₂, He, N₂, O₂</td>
</tr>
<tr>
<td>H₂O &lt; 3 ppm</td>
<td>H₂O &lt; 0.5 ppm</td>
</tr>
<tr>
<td>O₂ &lt; 2 ppm*</td>
<td>O₂ &lt; 0.1 ppm*</td>
</tr>
<tr>
<td>C₂H₄ &lt; 0.5 ppm</td>
<td>CO &lt; 0.1 ppm</td>
</tr>
<tr>
<td>except for O₂</td>
<td>CO₂ &lt; 0.1 ppm</td>
</tr>
<tr>
<td>except for H₂</td>
<td>C₃H₆ &lt; 0.1 ppm</td>
</tr>
<tr>
<td><strong>Air</strong></td>
<td>H₂ &lt; 0.1 ppm**</td>
</tr>
<tr>
<td>H₂O &lt; 3 ppm</td>
<td>H₂O &lt; 0.5 ppm</td>
</tr>
<tr>
<td>CO &lt; 1 ppm</td>
<td>CO &lt; 0.1 ppm</td>
</tr>
<tr>
<td>CO₂ &lt; 1 ppm</td>
<td>CO₂ &lt; 0.1 ppm</td>
</tr>
<tr>
<td>C₃H₆ &lt; 0.1 ppm</td>
<td>C₂H₂ &lt; 50 ppb</td>
</tr>
<tr>
<td><strong>CO₂, N₂O, C₂H₂</strong> (consult us)</td>
<td>SO₂ &lt; 10 ppb</td>
</tr>
<tr>
<td></td>
<td>NOₓ &lt; 10 ppb</td>
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</tbody>
</table>

**SMARTOP™**

The new, innovative cylinder packaging, which has been tested and approved in analytical laboratories:

- Protective and ergonomic cap ensures comfort and security.
- Ergonomic valve allows more efficient and accurate work:
  - Thanks to the volume indication you always know what the available volume is,
  - By simply moving the lever you can quickly open and close the valve,
  - SMARTOP™ is equipped with Residual Pressure Valve and Non-Return Valve that prevent contamination due to atmospheric backflow.
Creating value for our customers

Air Liquide shares years of experience and know-how in Specialty Gases and analytical techniques to provide you with comprehensive and competitive solutions.

- **Safety, Quality, Reliability**
  Air Liquide offers the best in industry safety measures and the best quality accredited internationally with the highest grade reliable customer service supported by our Air Liquide Industrial Management System.

- **Innovation**
  Continuous innovation on the products, features and services offered by interacting with the our customers:
  - 8 R&D Centers,
  - 1000 Researchers & Experts,
  - 2830 Active patented inventions.

- **Expertise**
  Over a century of experience in Specialty Gases across geographies and boundaries, with the best in house researchers, scientists and management personnel in the world. Participation in ISO committees allows us to anticipate regulatory demands and proactively deliver best in class mixtures.

- **Global Solutions**
  Bringing to our customers, all around the world, the offer based on fixed set of commitment.
  We are locally sensitive and globally aware.
Present in 80 countries, Air Liquide provides industrial and medical gases and related services. The Group offers innovative solutions based on constantly enhanced technologies. These solutions, which are consistent with Air Liquide’s commitment to sustainable development, help to protect life and enable our customers to manufacture many indispensable everyday products. Founded in 1902, Air Liquide has more than 46,200 employees. The Group has successfully developed a long-term relationship with its shareholders built on trust and transparency and guided by the principles of corporate governance. Since the publication of its first consolidated financial statements in 1971, Air Liquide has posted strong and steady earnings growth. Air Liquide is listed on the Paris stock exchange and is a component of the CAC 40 and Eurostoxx 50 indices (ISIN code FR 0000120073).