

THE LINDE GROUP
Linde

The total solution for your analytical requirements.

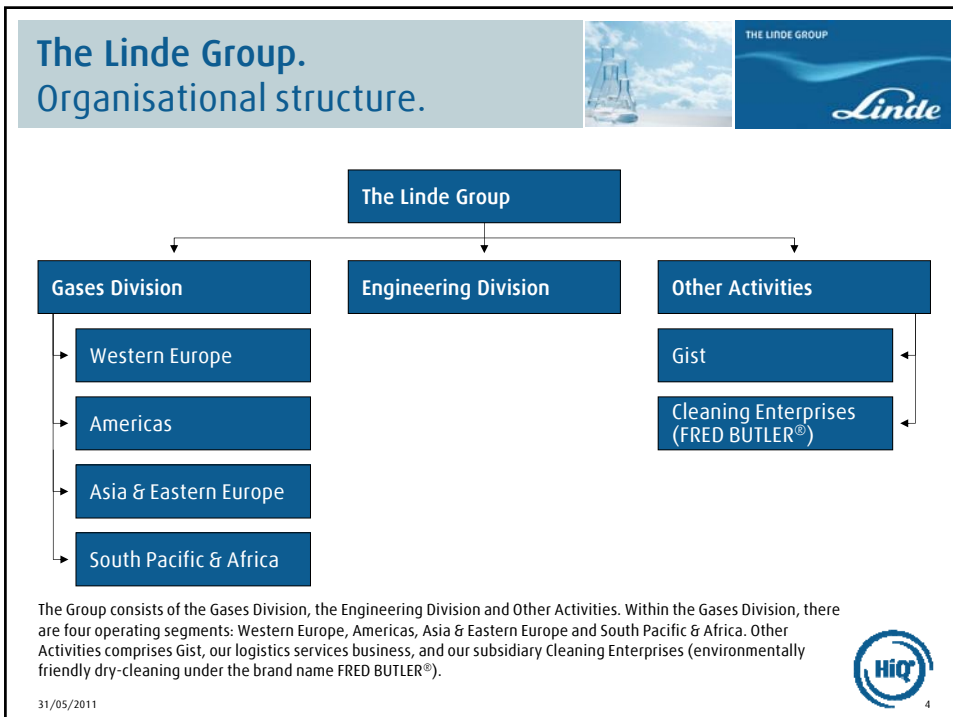
Commercial Laboratories, Research Institutes and Universities.

Content.

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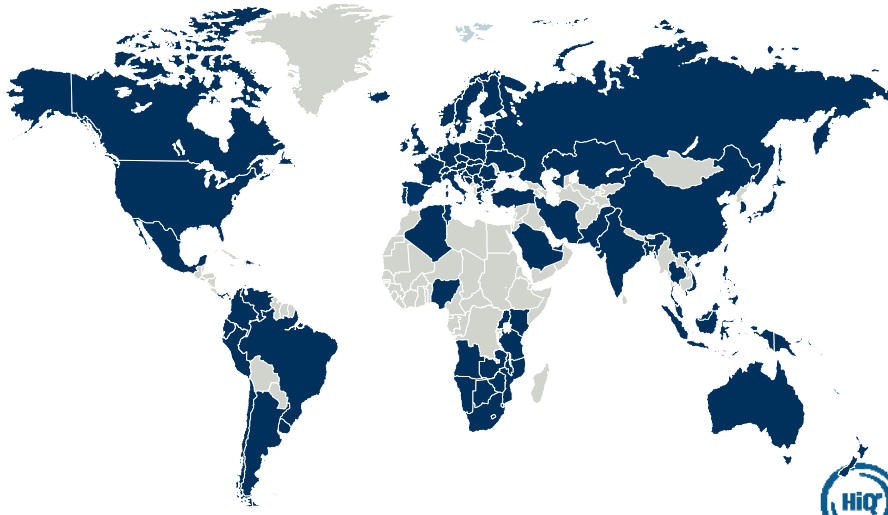
The Linde Group.

Global presence in more than 100 countries.



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The Linde Group.

Wide range of products and services.



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Gases

Air Gases

- Nitrogen
- Oxygen
- Argon
- Rare Gases:
Krypton, Neon and Xenon

Other Gases

- Acetylene
- Helium
- Propane
- Carbon Dioxide
- Carbon Monoxide
- Hydrogen

Specialty Gases

- Pure Gases
- Specialty Gas Mixtures

Medical Gases

- Medical Oxygen
- Nitric Oxide (NO)
- Nitrous Oxide (N₂O)

Services

Processes and equipment for use of gases in the most diverse applications

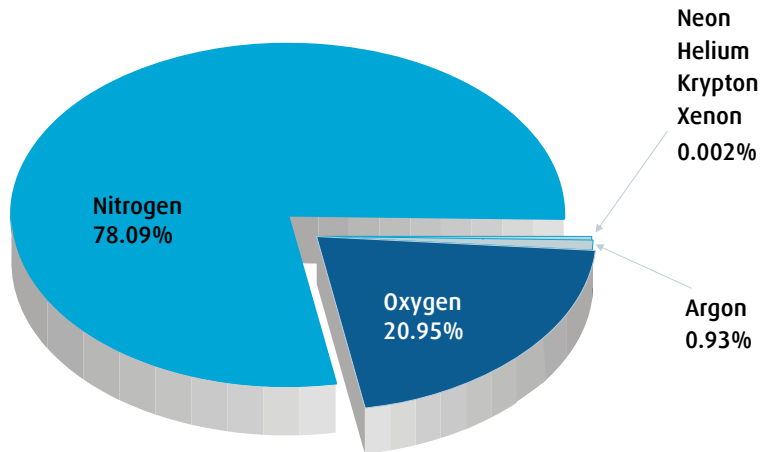
- Chilling, freezing and packaging of food
- Protection and dispensing of beverages
- Heating, melting and treatment of metal
- Welding and cutting in metal fabrication
- Water treatment and environmental protection
- Calibration and testing in laboratories
- Production of chemicals and pharmaceuticals

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The Linde Group.
Our raw material – gases of the air.



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The Linde Group.
Member of the UN Global Compact.



The United National Global Compact is a strategic policy initiative for business that are committed to aligning their operations and strategies with ten universally accepted principles in the areas of human rights, labour, environment and anti-corruption.

The Linde Group is member of the UN Global Compact.

2000 companies worldwide were members of the UN Global Compact by the end of 2008.

“ Markets can flourish only in societies that are healthy. And societies need healthy markets to flourish.”

— *H.E. Ban Ki-moon,*
UN Secretary-General



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The Linde Group. Origins.



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Carl von Linde

1870's Refrigeration system for breweries in Munich



First tank car for liquid oxygen

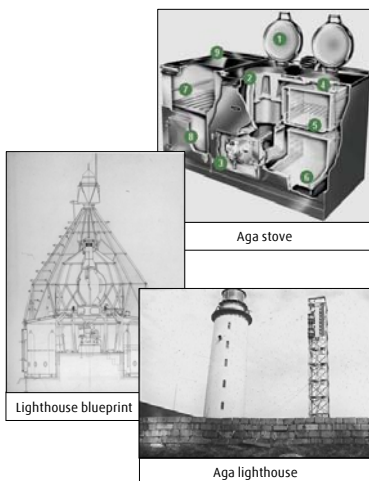
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- 1879 – Foundation of Gesellschaft für Linde's Eismaschinen AG in Wiesbaden, Germany
- 1885 – Foundation of Linde British Refrigeration Co. in London, Linde's first non-German company
- 1895 – Granting of patent to Carl von Linde for the "process of liquefying atmospheric air or other gases"
- 1954 – Foundation of Linde-BOC joint venture BOLLORÉ, coordinating the technical design and sales of air separation plants
- 1990s – Construction of Linde's largest gas production plant at Leuna, Germany
- 2000 – European Commission approves Linde takeover of Swedish gas company AGA
- 2004 – Linde 125th anniversary
- 2006 – Linde and BOC join forces to become The Linde Group.



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The Linde Group. Origins.



Aga stove

Lighthouse blueprint

Aga lighthouse

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AGA

- 1904 – AB Gas accumulator founded
- 1911 – Acetylene lighting systems for railroads
- 1912 – Gustav Dalen wins Nobel Prize for physics for Sun Valve technology
- 1912 – AGA Lighthouse contract for Panama Canal
- 1929 – AGA stove



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The Linde Group. Origins.



- 1880 – Arthur and Leon Brin take out the first of their patents on a process for separating
- 1886 – Foundation of Brin’s Oxygen Company Ltd.
- 1906 – becomes The British Oxygen Company Ltd.
- 1935 – BOC buys controlling stake in African Oxygen, South Africa (now AFROX), becoming the leading gas company in Africa
- 1990s – Supplier of helium for Macy’s Day parade
- 1994 – 25th anniversary of BOC distribution unit’s partnership with Marks & Spencer
- 2000 – Construction of world’s largest nitrogen plant to pump heavy crude oil under high pressure in the Cantarell Oil fields, Mexico – an innovative joint project involving Linde, BOC and partners



Medical Oxygen



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The Linde Group. Origins.



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AGA



BOC



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HiQ® Specialty Gases Solutions.



HiQ® Specialty Gases Solutions.



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HiQ® represents the best there is in the world of high purity gases, process and calibration gas mixtures, precision engineered supply solutions, and the high quality services needed for optimum results.



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HiQ® Specialty Gases Solutions.



Products

Pure gases
Gas mixtures
Equipment
Central gas supply
Installations

Services

Analytical certificates
Traceability
Safety
Trainings
Logistics

Automotive, Biotech, Chemical,
Pharmaceutical, Petrochemical,
Environmental, Manufacturing,
R&D institutes,
Universities

Customers

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HiQ® Specialty Gases Solutions.



For all the specialty gas needs in your specific industry.



Gas mixtures



High purity gases



Logistics and distribution



Gas supply systems and services

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HiQ® Specialty Gases.



HiQ® specialty gases have an important role in many areas of research, development and commercial laboratories, e.g.

- Raw materials for chemical synthesis
- Catalysts in chemical reactions
- Zero, purge, and calibration of analytical equipment
- Carrier and detector gas
- Environmental calibration standards
- Rare gases and isotopic standards
- Research hydrocarbons and chemical gases



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HiQ® Specialty Gases. Calibration and Process Gas Mixtures.



Gas Mixtures are unique to application and industry requirements. A wide range of calibration gas mixtures, from binary to multi-component requirements, are used to ensure proper calibration and correct operation in a variety of analytical equipment.

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HiQ® Specialty Gases. Chemical and Rare Gases.



HiQ® offers the highest purity of rare gases, such as Neon, Krypton and Xenon supplied in a variety of cylinder packages and amounts. Deuterium and other isotopic products can be sourced on request.

Research Hydrocarbon products include Ethane, Methane and others are available in a variety of purity grades and package sizes to meet every requirement.

Chemical gases, such as Carbon Monoxide, Hydrogen Chloride, Ammonia, and Sulphur Dioxide can be supplied to meet requirements from small cylinder to large bulk containers or trailers.



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HiQ® Specialty Gases. ECO CYL® portable specialty gas solutions.



The requirement for calibration gases in small, portable cylinders has expanded as applications in areas such as remote environmental monitoring, industrial hygiene, health & safety and mobile laboratory instrumentation continue to grow.



ECO CYL® are small, refillable cylinders equipped with cylinder valve, pressure regulator and flow meter fully integrated within the cylinder protection cap. The result is an easy, ready for use system.



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HiQ® Specialty Gases. Gases in Small cylinders.



Many sectors and applications are experiencing a strong trend towards miniaturisation. Fuel cells and analysers, such as the Micro-GC, are also being developed in increasingly smaller sizes, making it necessary for the gas supply to be just as compact.

MICROCAN® from Linde is a high-pressure cylinder with a maximum of 200 bar filling pressure.



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HiQ® Specialty Gases. SPECTRA-SEAL® Calibration Standards.



SPECTRA SEAL® environmental products offer stability for reactive environmental monitoring standards.

Linde SPECTRA-SEAL® Calibration standards are recognized around the world for consistent flat-line results every time during the life of the mixture.



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HiQ® Specialty Gases. Analytical Certificates.




- Follows international standard ISO 6141 requirements
- Traceability
- Quality assurance
- Copy proof
- Documented **Accreditation** where required.




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HiQ® Specialty Equipment.






A critical point when using gas for analysis and high tech production is to maintain the integrity of the gas between cylinder and instrument or reactor.

The quality of the gas is often not better than the quality of the distribution system.

With this in mind, Linde created the HiQ® Specialty gas equipment product program.

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HiQ® Specialty Equipment.



BASELINE® gas supply products are designed for gases up to 5.0 purity (99.999%).



REDLINE® gas supply panels, cylinder regulators and point of use are designed for purities up to 6.0 (99.9999%).



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HiQ® Specialty Equipment.



Design and installation of total gas supply systems to meet individual customer requirements.



HiQ® Cylinder Storage solutions ensure gas cylinder safety. Choose from indoor single cylinder type to full size outdoor storage containers.



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HiQ® Specialty Equipment. Cylinder Regulator Guide.



<http://hiq.linde-gas.com>

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Cylinder Regulator Guide

Selected outlet:
Hose barb



Restart →

Chosen product:
BASELINE®
Chrome plated brass
Single stage
Shut-off valve
Hose barb

→ Get quotation

hiq@linde-gas.com

selection: > product line > material > single or two stage > valve > outlet



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HiQ® Specialty Equipment. Nitrogen Gas Generators.



HiQ N₂ MISTRAL-0

Gas generators are small and create flexibility in the set up of the laboratory and simplifies rearrangements of the lab.

The HiQ® N₂ SIROCCO generators use a patented DUAL STEP pressure swing adsorption (DS-PSA) system, and delivers up to 5 l/min (5 bar) of pure nitrogen gas.



HiQ N₂ SIROCCO
HiQ N₂ MISTRAL-LCMS

The HiQ® N₂ MISTRAL-LCMS generator is designed to deliver larger capacity flow rates required for LC/MS instrument operation.



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HiQ® Specialty Equipment. Hydrogen Gas Generators.



Where the use of cylinder hydrogen is restricted, the HiQ® hydrogen laboratory gas generator is safe to operate, due to its small contained volume (< 40 ml).



The HiQ® H₂ FID generator is ideal as fuel gas for the GC-FID's or as reactor gas for other types of detectors.

The HiQ® H₂ CARRIER generator has been designed to replace Helium or Nitrogen as carrier gas.

The HiQ® H₂ Air FID station has been designed to feed GC's with Hydrogen and Zero Air at the same time.



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HiQ® Specialty Equipment. Zero Air Generators.



Using an onsite gas generator eliminates the need to recalibrate instruments after replacing empty cylinders with full ones. The operation of the generator requires low levels of electrical power.

The HiQ® Ultra Zero Air series helps creating a truly flat baseline. The HiQ® Ultra Zero Air generators reduce HC, NO_x and SO₂ pollutants to less than 0.1 ppm, CO₂ to less than 5 ppm and remove all kinds of particles.

The HiQ® Zero Air generators reduce hydrocarbon pollutants to less than 0.1 ppm and remove all kinds of particles.



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HiQ® Specialty Equipment. On-site hydrogen generation systems.



The HOGEN® HGS is a proton exchange membrane (PEM) water electrolysis system that uses electricity to separate water into hydrogen and oxygen. The hydrogen is produced at 13.8 bar/200 psi pressure without a compressor and at a purity of 99.9995 % continuously and without operator intervention.

Due to its unique design, the HOGEN® HGS contains virtually no hydrogen, even when generating hydrogen at up to 6Nm³/h.



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HiQ® Specialty Equipment. Portable Gas Detection Instruments.



G-TECTA™ single gas instruments are compact and easy to wear, ensuring your safety whilst being unobtrusive and comfortable.

G-TECTA™ SG₂ - 2 year Disposable Gas Detector

G-TECTA™ SG - Premium Single Gas Detector



G-TECTA™ multi-gas instruments have upward facing displays, maximising the awareness of the gas levels in confined spaces with reliable safety performance.

G-TECTA™ 4G - Premium Multi-Gas Detector

G-TECTA™ 4GP - Premium Multi-Gas Detector with Pump



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HiQ® Specialty Services. Administrative Efficiency.



Boost your business with efficient commercial processes

Your benefits

- Reduced costs through quick and easy processes
- High level of transparency to control your costs
- Simplification of commercial processes



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HiQ® Specialty Services. Supply Reliability.



Keep focused on your main objectives with our uninterrupted gas supply

Your benefits

- Uninterrupted availability of gases
- Solutions for your unique delivery requirements
- Immediate support to meet unforeseen demands



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HiQ® Specialty Services. Safety training.



Teach your employees the properties and potential risks of different gases

Your benefits

- Training of safe gas handling and usage from a theoretical and a practical perspective including videos and live demonstrations
- Increased level of safety through a better understanding of the properties and risks of common gases
- Compliance with the latest safety regulations and rules concerning industrial gases
- Instruction from experienced industry-trained experts



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HiQ® Specialty Services. Product Stewardship.

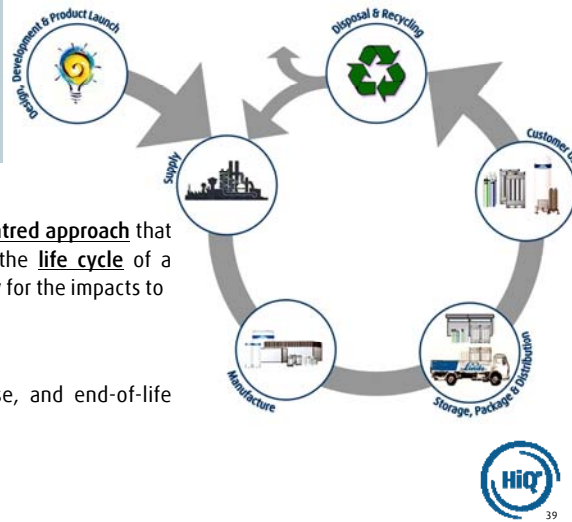


“The responsible and ethical management of the safety, health and environmental risks of our products throughout their product life-cycle”

Product Stewardship is a **product-centred approach** that directs all participants involved in the **life cycle** of a product, to take shared responsibility for the impacts to

- human **health and safety**
- the **environment**

that result from the production, use, and end-of-life management of the product.



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HiQ® Specialty Services. <http://hiq.linde-gas.com>



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Ask the HiQ Expert Team

You can't find the information you need or want on our website? You want to make a direct enquiry for a special gas mixture? You have a specific question that you want to be answered by an expert?

Ask the HiQ® Expert Team to receive competent answers to your questions.



- Related Links**
- [FAQ \(Frequently Asked Questions\)](#)
 - [HiQ contacts around the world](#)

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HiQ Expert Team - Contact

HiQ Expert Team
Telephone +49-89-7446-1661
Fax +49-89-7446-2071
→ [Send message](#)

hiq@linde-gas.com



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Precision matters in everything we do.