



TECHNOLOGIES

Customizable technologies and leading engineering services to gain a competitive advantage across a broad range of industrial processing operations.

LNG – Liquefied Natural Gas Solutions

Air Liquide Global E&C Solutions' cryogenic experience is available for LNG liquefaction and regasification.

We supply small- to large- scale plants, and equipment to serve applications ranging from peak shaving, LNG as a fuel, to base load LNG for export markets.

Air Liquide's cryogenics business has been at the heart of the company for more than 100 years. This know-how was used for LNG in the late 1960s with the development of the first base load LNG Plant in Algeria, having a total capacity of one million tons per annum. In addition, Air Liquide Global E&C Solutions has constructed 15 LNG peak shaving facilities in the Americas. With the increasing demand for cleaner energy alternatives around the world, Air Liquide Global E&C Solutions has reignited its offer to the market to cater for our customers' needs.

Our solutions provide improved plant efficiency using our own proprietary technologies, cost effective solutions embedding simplified construction features, high reliability and simplicity of operations and maintenance, scalable end-product which grows with the business, and the overall Air Liquide partnership from conception through to start-up of a plant.

Our solutions for LNG include technologies and equipment for:

- Standardized plants for the small size range
- Modularized plants and equipment for the mid to large size range
- Equipment for LNG regasification

Services:

Conceptual studies (including the definition of the technical solution and support to business plans)

Pre-feasibility, Pre-Front End Engineering Design (FEED) Studies and FEED studies

Engineering

Procurement and manufacturing of proprietary equipment

Construction & commissioning

After sales service and support (including plant debottlenecking)



Cryogenic Solutions

Air Liquide's world-class experience in cryogenic gas separation processes and equipment is centered on a commitment to safety, reliability, quality and competitiveness.

We offer a wide range of solutions, from small standardized and automated units to the world's largest air separation units, addressing markets such as metals processing, chemical conversion, oil & gas, electronics and more.

Based on our history and outstanding track record in delivering cryogenic plants to the industry, we accompany our clients along the entire project life-cycle: from the initial design phase to engineering, procurement and construction, through to operational support. Our solutions are designed to best integrate clients' facilities and optimized to reach an overall minimal cost of ownership. When and where required, we can tailor the design to our clients' exact specifications.

Our solutions include:

- Air separation units for the production of oxygen, nitrogen and rare gases
- Carbon dioxide (CO₂) capture
- Syngas separation and purification
- Helium purification and liquefaction
- Refrigeration systems



Adsorption Solutions

Since the 1960s, Air Liquide has been a pioneer in the development of adsorption technologies and processes and offers a wide range of adsorption solutions to the industry.

Our portfolio of adsorption solutions includes:

Pressure Swing Adsorption for hydrogen and helium separation and purification

Vacuum Swing Adsorption for on-demand oxygen generation

Thermal Swing Adsorption for front end purification for all cryogenic separations



Hydrogen and Synthesis Gas Generation

Air Liquide Global E&C Solutions offers a variety of robust and competitive technologies for the generation and conditioning of synthesis gas (hydrogen mixed with carbon monoxide) from all types of hydrocarbon feedstock, including coal.

Our portfolio of syngas technologies includes:

Steam methane reformer to produce pure hydrogen (Lurgi Reformer™)

Auto-thermal reforming (Lurgi MegaSyn™)

Coal gasification with Lurgi Fixed Bed Dry Bottom (FBDB™)

Heavy residues gasification with Lurgi Multi-Purpose Gasification (MPG™)

Natural gas partial oxidation (POX)



Acid Gas Cleaning Solutions

As a leading player for the whole syngas value chain, Air Liquide Global E&C Solutions has developed an extensive expertise for acid gas removal with more than a hundred units around the world.

Today we offer a variety of leading processes and tailored solutions to meet clients' down-stream application needs:

Rectisol™

Purisol™

Amines washes

CO-Shift™

Membranes systems



Sulfur Management

Over the years, we have developed a broad knowledge of the requirements and processes available for cleaning gases from their sulfur components.

Whether converting H₂S to sulfur or processing gases with different sulfur levels, our Lurgi sulfur management technology suite can help customers meet increasingly stringent environmental targets:

Lurgi Claus and OxyClaus™ processes and burners

Emission-free sulfur recovery

Lurgi Tail Gas Treatment (LTGT™)

Sub-dewpoint tail gas technologies (Sulfreen™)

Sulfur degassing (Aquisulf™)

Amines washed, membranes systems



Methanol and Propylene Production

Air Liquide Global E&C Solutions delivers Lurgi methanol technology that has been at the cutting edge of methanol production for over 50 years.

We can design plants that generate between 100 and 10,000 metric tons of methanol per day – from any feedstock. Our end-to-end systems are tailored to customers' specifications to ensure highly efficient and cost-effective production.

The renowned Lurgi Methanol to Propylene MTP™ technology supplements conventional propylene production to meet market requirements. The process has a high carbon and energy efficiency, and uses a simple and stable zeolite catalyst, offering a distinctly higher yield compared to steam crackers (65 % versus 30 %).



G2G™ - Gas-to-Gasoline

Air Liquide Global E&C Solutions' Lurgi Megamethanol™ technology, combined with ExxonMobil's proprietary methanol-to-gasoline technology, known as G2G™, is helping customers to transform natural gas, as well as other feedstocks, into motor gasoline containing virtually no sulfur and low in benzene content.

The combined solution minimizes project interfaces, off sites and logistics complexities, as well as overall investment for synthetic fuel production.

The G2G™ provides two proven technologies for one competitive solution:

Lurgi MegaMethanol™

ExxonMobil's Methanol-to-gasoline (MTG) technology

Lurgi MegaMethanol™ technology typically generates approximately 5,000 metric tons of methanol per day. This increased output drives gains in efficiency and cuts operating expenditure, opening the door to impressive gross margins and netback to our customers.

ExxonMobil's Methanol-to-gasoline (MTG) technology is simple to operate and scalable from 2,500 barrels per day (bbl/d) to more than 20,000 bbl/d. It meets the requirements for conventional gasoline, is fully compatible with refinery gasoline, and meets the Specification for Automotive Spark-Ignition Engine Fuel (ASTM) D4814.



Our Full Suite of Technologies

Air Liquide Global E&C Solutions services many industries with customizable technologies. We can offer complete solutions, from feasibility study to handover of the completed facility with all utilities connected. We are flexible in scope and able to provide optimization studies, licensing packages, integrated engineering and procurement (EP) as well as turnkey packages (including engineering, procurement, construction and management).

Air Liquide Global E&C Solutions' comprehensive technology portfolio:

Standard Plants

- Yango™ - Standard Air Separation Unit
- Sigma - Standard Air Separation Unit
- Vacuum Swing Adsorption On-Demand Oxygen Generation
- Nitrogen Generation system
- HYOS™ R - Hydrogen Generation system

Cryogenics

- Large Air Separation Unit
- CO Cold Box - Syngas Separation and Purification
- Liquid Nitrogen Wash
- Hydrogen and Nitrogen Recovery
- Cryocap™ H₂ - Cryogenic Carbon Dioxide Separation
- Cryocap™ Oxy - Cryogenic Carbon Dioxide Separation for Oxycombustion
- Helium Extraction and Liquefaction

Hydrogen

- Steam Methane Reforming (SMR) - Hydrogen and Syngas Production
- SMR-X™ - Zero Steam Hydrogen Production
- Pressure Swing Adsorption (PSA) - Hydrogen Purification

Syngas

Autothermal Reforming (ATR) - Syngas Generation
Lurgi MPG™ - Multi-Purpose Gasifier
Lurgi FBDB - Fixed Bed Dry Bottom Coal Gasification
Rectisol™ - Syngas Purification
Steam Methane Reforming (SMR) – Syngas production
Gas POX – Natural Gas Partial Oxidation

Petrochemicals

Low Pressure (LP) Methanol
Lurgi MegaMethanol™
Lurgi MTP™ - Methanol-to-Propylene
Butadiene Extraction
Acrylic acid
Acrylates
Distapex™
G2G™ - Gas-to-Gasoline

Natural Gas Treatment

Nitrogen Rejection Unit
Natural Gas Liquids Recovery
Acid Gas Removal

Sulfur

OxyClaus™ Sulfur Recovery Unit
Sulfur Recovery Unit
Claus - Emission-Free Sulfur Recovery Unit

Liquefied Natural Gas (LNG)

Small-scale LNG (Nitrogen Refrigeration Cycle)
Mid- to Large- scale LNG (Mixed Refrigerant Cycle)
Boil-Off Gas Reliquefaction

Oleochemicals

Sliding Cell Extractor - Seed Crushing and Extraction
Natural Oil Refining

Lurgi Biodiesel

Fatty Acid

Glycerin Distillation and Bleaching

Fatty Alcohol

LP3 - Low Pressure Fatty Alcohol Production

Bio Propylene Glycol

Sorbitol Production

[NEWSROOM](#) [SITE MAP](#) [LEGAL NOTICE](#) [AIR LIQUIDE GROUP](#) © COPYRIGHT AIR LIQUIDE 2013

