

LNG Project Development Services



Avoid costly re-work and improve profitability

Process Design Scope

As a process licensor, Air Products provides the process design for the liquefaction area of the plant. Our LNG processes include, AP-C3MR™, AP-DMR™, AP-X®, AP-SMR™, AP-N™ and AP-C1™ liquefaction processes. Depending on the project, our process design models can be extended to include:

- Feed gas chilling for moisture removal
- Fractionation pre-cooling for NGL (natural gas liquids) removal
- Fractionation - scrub column, LPG (liquefied petroleum gas), NGL, expanders
- Flash gas
- Nitrogen rejection
- Helium extraction

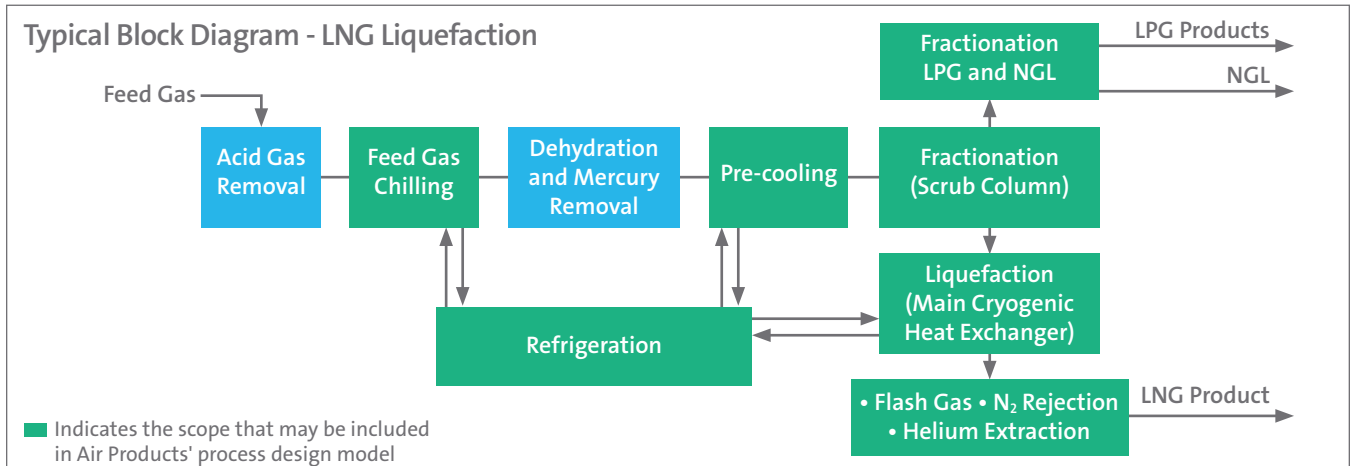
We also offer review services for heavy hydrocarbon (HHC) removal using adsorption technology to allow customers to leverage Air Products' adsorption expertise. This technology offers advantages for lean gas feeds with HHCs.

Why talk to us first? Selecting the optimal liquefaction technology for an LNG plant early in the project can significantly improve overall profitability. From the beginning, our team of experts can empower you with knowledge to make the right decisions and avoid costly re-work.

Most Experienced Provider in LNG liquefaction technology

Air Products performs dozens of process studies every year, continually optimizing processes and developing new concepts built on a foundation of over 50 years of industry experience. Our LNG process technology and equipment is used in over 100 LNG trains around the world, ranging in size from small peak-shaving plants to large mega-trains. We are an independent provider of process technology and equipment and have successfully worked with the majority of EPC (Engineering, Procurement, and Construction) contractors and Owner/Operators in the LNG industry.

Air Products' LNG liquefaction specialists are experienced with process feasibility studies as well as developing preliminary process designs that can enable you and your EPC to identify, evaluate, and employ the most effective configuration for your project. Our liquefaction process designs integrate the critical liquefaction equipment, such as the coil wound heat exchangers (CWHE), compressors (turbo-expander compressors), refrigeration compressors and drivers, and supporting process systems to achieve first class performance and reliability based on proven technology. Air Products also has a long history of successful introduction of new LNG liquefaction technologies and innovations.



Dynamic Simulations

Air Products has 30 years of experience carrying out detailed dynamic simulations, which can help you understand complex operating transitions, such as parallel compressor trips, process control dynamics, and flare loading. Refrigerant compressor blocked discharge studies save project costs by reducing design flare loading.

LNG Technology Success Stories

- Over 120 CWHEs shipped—In 2012, Air Products shipped our 100th CWHE and has successfully manufactured and shipped 21 additional exchangers since then.
- Split-MR™ Machinery Configuration – this unique machinery configuration enables effective use of available power from two identical gas turbines, while simplifying maintenance and continuing ease of operation. It has now been successfully implemented in over 20 LNG trains worldwide.
- AP-C3MR™ LNG Process with parallel compression and aeroderivative gas turbines – Air Products' design is successfully operating at high reliability since 2014. Operation continues while parallel turbines undergo maintenance.
- AP-SMR™ LNG Process – first implemented by Air Products in Libya in 1970, Air Products has recently optimized this process for mid-scale facilities operating in China.
- AP-N™ LNG Process – the world's first offshore floating LNG (FLNG) facility and first N₂ recycle process in baseload LNG service is in operation in the South China sea since 2016 and successfully passed its performance test.
- AP-X® LNG Process – the largest LNG trains in the world producing 7.8 MTPA LNG since 2009.



About Air Products

Air Products is a world leading industrial gases company celebrating 80 years of operation. The company's core industrial gases business provides atmospheric and process gases and related equipment to manufacturing markets, including refining and petrochemical, metals, electronics, and food and beverage. Air Products is also the world's leading supplier of liquefied natural gas process technology and equipment.

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