



Acid Gas Cleaning and CO₂ Recovery

As a world class player for the whole syngas value chain based off our experience in the development of diverse gas cleaning processes, since the beginning of the 20th century, Air Liquide Global E&C Solutions offers a variety of leading processes for cleaning syngas (incl. the recovery of CO₂ and Cryocap™) and tailoring solutions to meet your down-stream application needs.



Synthesis gas (syngas) is a gaseous mix containing mainly hydrogen (H₂) and carbon monoxide (CO). Depending on the feed-stock utilized for the production of syngas, the down-stream application (industrial gas, energy, catalytic conversion), the purification of syngas as well as the adjustment of H₂/CO ratios and CO₂ contents are mandatory steps of the process. Air Liquide Global E&C Solutions delivers the most competitive technology for the purification and conditioning of synthesis gas (incl. CO₂ recovery) in the world.

Acid gas removal (AGR)

Air Liquide Global E&C Solutions has installed close to 100 units for acid gas removal around the world. Thanks to our extensive expertise, we can deliver the most appropriate acid gas treatment for your pipeline and LNG specifications.

Rectisol®

Rectisol is the most competitive technology for the purification and conditioning of syngas which is mainly generated from coal or residue containing a high level of unwanted impurities. The process uses refrigerated methanol as the solvent for physical absorption.

Among other advantages, it is able to remove all impurities and trace contaminants in one single process and can also produce ultra-pure product gas, as well as tailor-made stoichiometrics for any kind of synthesis in combination with either raw gas shift or with integrated clean gas shift.

Purisol®

Air Liquide Global E&C Solutions has licensed and built numerous Purisol® plants worldwide using Lurgi technology. The technology uses an organic solvent for the selective removal of sulfur species from the syngas, leaving the CO₂ in the cleaned gas. Other results include the treatment of high H₂S natural gas, de-sulfurisation of turbine gas in integrated gasification combined cycles (IGCCs), and the H₂S removal from HP hydrogen.

Its advantages include a low solvent circulation rate, extremely high H₂S /CO₂ selectivity for excellent Claus gas quality, as well as low energy requirements due to effective regeneration.

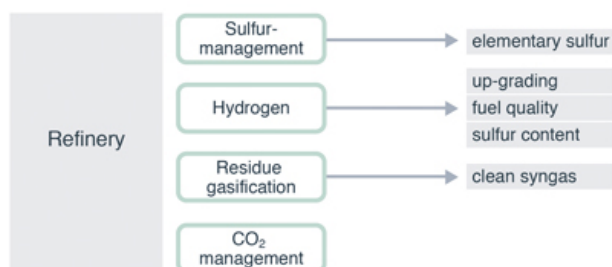
Amines

The majority of gas cleaning requirements in the syngas industry rely on chemical washing based amines. In particular, for natural gas based syngas, chemical washing is the technology of choice in terms of optimized total cost of ownership. Air Liquide Global E&C Solutions offers chemical absorption processes with aqueous amine solutions for treating syngas streams as well as other hydrocarbon streams (e. g. hydrocracker effluent etc.) containing H₂S and CO₂. Depending on the composition and operating conditions of the feed gas, different amines can be selected to meet the product gas specification.

CO-Shift

In order to meet the H₂/CO ratio of the down-stream consumer of syngas or to achieve the maximum yield in a hydrogen plant, application of a CO shift process is necessary. This process uses steam to convert the carbon monoxide (CO) derived from syngas in gasification, natural gas or other carbon monoxide containing gases into hydrogen. For CO-rich syngases generated typically from residue or coal sour or clean shift can be applied. For the production of hydrogen from natural gas, the shift reactor can be operated at high or low temperature. Depending on the project requirements the reaction can be carried out either in the adiabatic or in the isothermal mode. Our expertise in this field is further backed by close cooperation with reputable catalyst suppliers.

Refinery emission control



Membranes

Membrane systems are modularized and can be tailored to specific raw gas compositions. The key benefits include lower operating costs and a more compact footprint when compared with amine wash-based systems.

New technology developments are being introduced for the cleaning of landfill biogas and coal bed methane.

