

METHANOL PURGE

RECOVERY AND RECYCLING OF EXCESS HYDROGEN

DESCRIPTION

Methanol is produced from syngas, a combination of hydrogen, carbon monoxide, carbon dioxide and inert byproducts. In order to successfully synthesize, it is required that a methanol loop recycle back to the reactor. To combat the accumulation of inerts in the reactor loop, a slip stream routed to Air Liquide Advanced Separations' (ALaS) membranes vents out unwanted products while simultaneously recovering and recycling hydrogen to send back to fuel, back to the reactor or to use for other applications. Our high selectivity polyaramide hollow fiber membranes offer the most robust solution for advanced and complex separations. Customers that utilize ALaS membranes are able to recover and recycle profitable reactants, resulting in increased productivity, flexibility and control over methanol operations.

CUSTOMER BENEFITS

H₂ recovery > 90%, H₂ purity > 90%

- No moving parts
- Skid mounted systems cartridge design for simple installation
- Estimated payback period of less than a year
- High permeability membranes for compact, low capital system design
- Unrestrained turndown capabilities
- Automated turndown system for ease of operation and safety
- Linear scale up for all size systems
- Hollow fiber membranes offer higher area to volume efficiency resulting in better packing efficiency, smaller footprint and reduced weight and module count

TECHNOLOGY

H₂ is selectively separated from CH₄, N₂ and Ar by permeation through a polymeric hollow fiber membrane. The driving force is the partial pressure difference across the membrane for H₂, CH₄ and other gas components. H₂ is the "fast" gas, whereas inerts are the "slow" gases. The pressurized feed gas enters the bundle from the shell side; the syngas stays under pressure while the H₂ is collected at a lower pressure from the fiber bore.

