

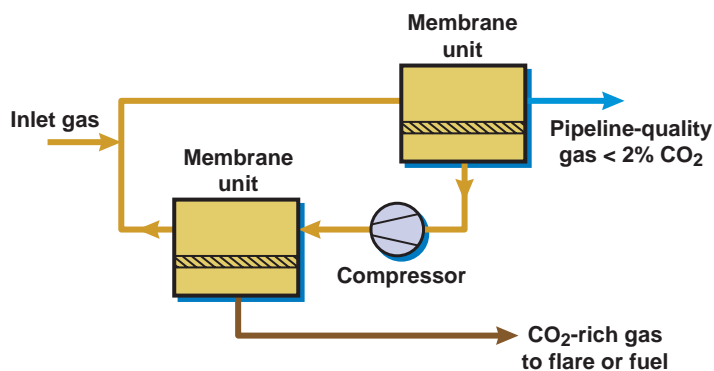
CO₂ REMOVAL FROM NATURAL GAS

Problem

CO₂ is found in natural gas in many locations and must be removed to meet specifications before the gas can be delivered to the pipeline. Availability of a simple process technology that can be applied in remote, unattended, or offshore situations is highly desirable. Ease of operation, quick start-up, and high on-stream factors are needed in addition to competitive capital and operating costs.

Amine systems are used frequently but are complex and have high capital, operating, and installation costs; a relatively high fuel cost and potential environmental issues.

Membrane Solution



MTR's membrane based systems provide a simple, low-cost, compact solution for reducing CO₂ content in natural gas. These novel membranes have a unique polymer chemistry that is far superior to conventional membranes in withstanding the various components in natural gas. The membranes require minimal gas pretreatment and offer very high efficiency separation, with more than 95% hydrocarbon recovery achievable.

These membranes are used for achieving pipeline CO₂ specifications of 4 mol% or less or for bulk CO₂ removal. Due to the high fluxes of these membranes and efficient module packaging, using MTR's membrane process minimizes required deck space and weight in offshore installations.

- Removes CO₂ from wellhead gas
- Very low hydrocarbon losses
- Robust membrane chemistry avoids most gas pretreatment
- Uses simple, rugged skid-mounted construction for quick installation
- Quick automated startup takes minutes from cold start to steady state
- Tolerates a wide range of inlet feed conditions
- Excellent turndown capability
- Very high availability factor

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MTR supplied CO₂ removal system operating at a Texas gas well

Benefits

- CO₂ content reduced to required specifications (<2 mol% or optimal levels)
- Limited pretreatment required due to robust membrane chemistry
- Unique process design to maximize total hydrocarbon recovery
- High-efficiency packaging minimizes space and weight, making the units ideal for offshore applications
- Easy, low-cost installations. In many cases, single skid systems can be installed in hours
- Robust, proven membrane performance at high CO₂ contents
- No regular maintenance, no moving parts, and designed for remote unmanned operation
- High on-stream times maximize revenues

System Performance

- Feed Rate: < 1 MMscfd to > 300 MMscfd
- Feed CO₂ Content: > 40 mol% to < 5 mol%
- Product CO₂ Content: to < 2 mol%
- Hydrocarbon Recovery: > 95% +

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