Pall Corporation

Oil and Gas: Application Focus

Membrane CO_2 Removal

Ensure your CO_2 removal reliably meets your daily production quotas and membrane protection needs.

Process Description

Carbon Dioxide (CO_2) is commonly found in many natural gas fields, in concentrations up to 80% volume. The removal of CO_2 is important both from a fuel value standpoint (increased heating value) and protection against downstream corrosion. While there are several acid gas (CO_2 is an acid gas) removal technologies, membranes are quickly becoming viable candidates. Membrane separation in this case is by solution diffusion, which means that the membrane is non-porous and CO_2 dissolves and diffuses through the solid barrier. The membrane area needed depends on several parameters (such as hydrocarbon purity and feed temperature). Membrane elements come in two flavors, spiral wound or hollow fiber, both intended to provide the required membrane area in a compact format.

The CO_2 removal is carried out with one or two membrane stages to reduce the area needed for a desired separation. The permeate gas stream from stage 1 is sent to stage 2 for additional recovery of hydrocarbons.

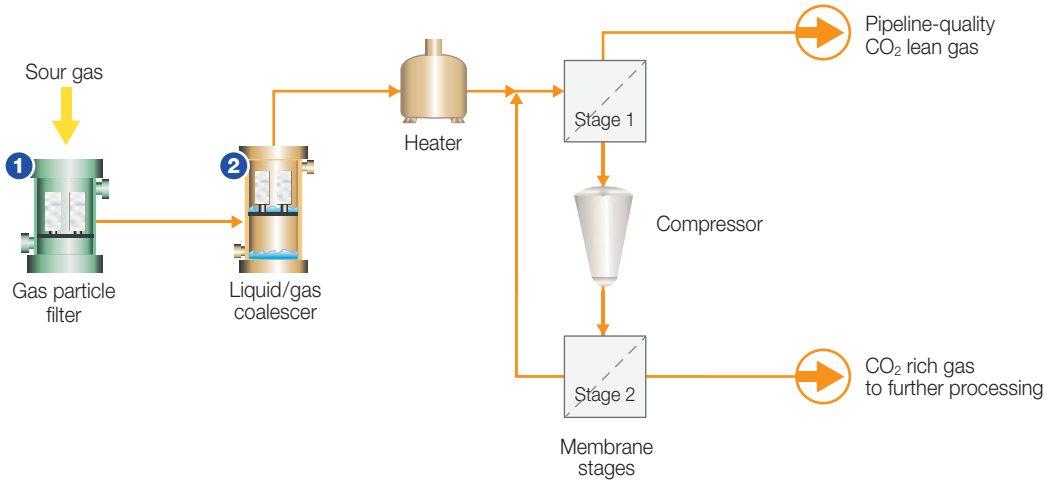
Gas Plant Needs

- Achieve or exceed natural gas production quotas via reliable CO_2 removal from raw natural gases
- Protect against ingression of liquids causing swelling and damage to the polymeric membrane
- Protect against fouling and blockage of flow paths by entrained solids

Production Challenge / Pall Solution

Challenge	Solution
Membrane degradation due to liquid and aerosol ingression coating the membrane surface leading to swelling and in some cases loss of integrity	**Improve your membrane CO_2 removal unit efficiency and reliability** with effective liquid and solid removal upstream of the adsorption beds to protect against membrane damage and capacity loss. • High efficiency SepraSol® Plus liquid/gas coalescers and Medallion™ HP liquid/gas coalescers provide 99.999% removal at 0.3 microns per the DOP test and 1 ppb downstream per the modified ANSI/CAGI-400-1999 test procedure.
Membrane element fouling and plugging due to solids carried by the untreated natural gas	**Protect membrane flow paths against fouling and plugging** through effective solids control. • The DGF Dry Gas Particulate Filter removes contaminants from the untreated hydrocarbon gas stream before it enters the CO_2 removal unit.

Process Flow Diagram



Key Applications / Filter Recommendations *(other applications not shown)*

	Application	Pall Product	Advantages	Customer Benefits
1	Membrane element protection	Gas particle filters to control contaminant ingression into membrane separation unit	Protect flow paths against fouling and plugging	Membrane CO_2 removal unit reliability by elimination of solid contaminant ingression
2	Membrane protection	Liquid/gas coalescers to remove incoming liquids	Remove liquid water and hydrocarbons that shorten membrane life and efficiency	Productivity, reliability and on-spec CO_2 content via maintained membrane efficiency and capacity

Experience Matters

Don't take our word for it. Just ask the thousands of oil and gas engineers around the world why Pall is their supplier of choice for filtration and separations solutions. Let them tell you how our extended filter life and simple maintenance protocols save them time that can be spent on value-add process improvements. Ask them about the reliability and consistent output from the Pall systems installed in their critical processes. You don't want to spend time worrying about your filters and coalescers, and we don't want you to either.

Contact Pall today and let us put our 50+ years of experience to work for you.

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