Gas Sweetening

Introduction

Carbon dioxide (CO2) and hydrogen sulphide (H2S) are common impurities in natural gas. These impurities need to be removed to different levels to meet each client’s specific process requirements.

The most common methods for removal of CO2 and/or H2S from the gas is via amines, physical solvents, membranes or adsorbents. The choice of which technology to use depends on the levels of impurities to be removed.

Process Group has extensive experience gained through designing, fabricating and commissioning CO2 and H2S removal systems over many years.

Process Group pioneered the use of membranes for CO2 removal from natural gas in Australia. When considering a CO2 removal project, Process Group determines the best technology to meet our client’s needs. This may include considering the use of solvents and membranes for a given application or a combination of both to provide our client with the best possible process solution.

Amines & Physical Solvents

Design Basis

Each package is typically designed and built as a complete turn-key ready package with particular emphasis on specific client requirements.

Process Group is able to combine our expertise with proprietary sour gas process simulation software to tailor process designs to suit each application.

As a result of our significant design and installation experience, Process Group offers a complete range of process solutions to remove CO2 and H2S impurities by selecting from a range of solvents including generic amines, proprietary amine blends and physical solvents.

The design of each gas sweetening plant is unique for each application. Where amines or physical solvents are selected Process Group is able to choose from a range of commercial and generic solvents, the solvent that is best suited to meet the needs of each specific application in terms of CAPEX, OPEX and environmental issues is selected.

In many cases, plant operating flexibility is a major factor and Process Group is able to provide a plant that is compatible with a number of different solvents.
Process Group ensures each plant is optimised for the following considerations:

• To meet sales gas H2S & CO2 specifications,
• Impurity removal to minimise foaming,
• Operating efficiency,
• Materials compatibility.

Reference Clients

• BP
• RAK Gas
• BOC
• AGL
• BHP Billiton
• Black & Veatch
• CB&I

Membranes

Design Basis

Each package is typically designed and built as a complete turn-key ready package with particular emphasis on specific client requirements.

The design of CO2 removal systems is unique for each application and so a design basis is determined by first gaining a thorough understanding of the client requirements.

Membranes offer specific advantages over solvent based processes including:

• Low operator requirement
• Elimination of solvents from plant environment
• Simple operation
• Ideal for onshore and offshore applications
• No moving parts

In the same manner that Process Group evaluates solvents for CO2 removal, Process Group reviews the suitability of membranes for a given application and works with the membrane vendor to provide a solution that is specifically tailored to suit the requirements of each application.

This includes developing the optimum overall plant configuration and pre-treatment to ensure the membranes are protected from contamination by heavy hydrocarbons and other impurities.

Where CO2 levels are high enough a plant design combining membrane and amine solvent may offer the best overall plant solution.

Reference Clients

• Origin Energy
• Santos
• BHP Billiton