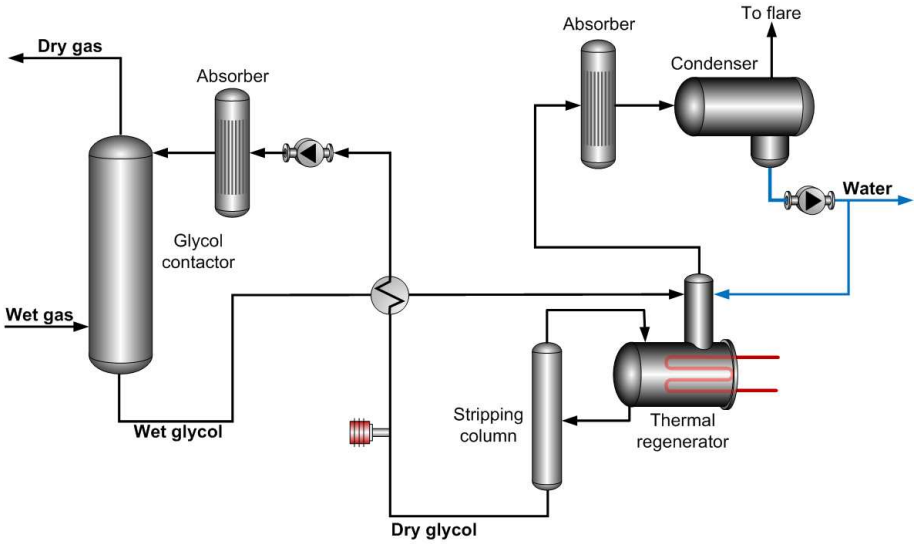
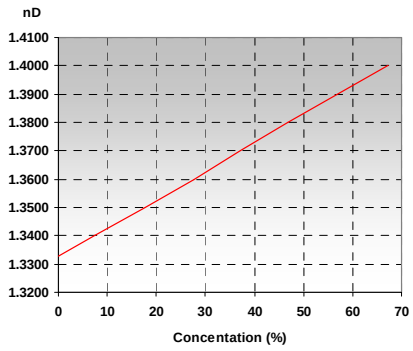


DIETHYLENE GLYCOL (DEG), TRIETHYLENE GLYCOL (TEG)

Typical end products

Pipeline quality dry natural gas

Chemical curve: Ethylene glycol R.I. per Conc% b.w. at Ref. Temp. of 20˚C



Introduction

Natural gas processing consists of separating all the various hydrocarbons and fluids from the pure natural gas to produce what is known as “pipeline quality” dry natural gas. It means that before the natural gas can be transported, it must be purified and most of the associated water must be removed.

Most of the liquid, free water associated with extracted natural gas, is removed by simple separation methods at, or near, the wellhead. However, the removal of the water vapour, which exists in natural gas solution, requires a more complex treatment. This treatment consists of “dehydrating” the natural gas, which usually involves one of two processes: either absorption or adsorption.

Application

An example of absorption dehydration is known as Glycol Dehydration. In this process, a liquid desiccant dehydrator serves to absorb water vapour from the gas stream. Glycol, the principal agent in the process, has a chemical affinity to water. During the process, the glycol concentration decreases and water content increases. Due to glycol loss continuous replenishment is required.

The regeneration should be minimized since it involves combustion emission. The refractometer indicates when glycol regeneration is required.

Essentially, a glycol solution is used in glycol dehydration, usually either Diethylene glycol (DEG) or Triethylene glycol (TEG), which is brought into contact with the wet gas stream in what is called the “contactor”. The glycol solution will absorb water from the wet gas. Once absorbed, the glycol particles become heavier and sink to the bottom of the contactor, where they are removed from. The natural gas, having been stripped of most of its water content, is then transported out of the dehydrator.

The glycol solution, bearing all of the water stripped from the natural gas, is put through a specialized boiler designed to vaporize only the water out of the solution. While water has a boiling point of 100ºC (212ºF), glycol does not boil until 200ºC (392ºF). This differential boiling point makes it relatively easy to remove water from the glycol solution, allowing it to be reused in the dehydration process.

Installation

The K-Patents Process Refractometer PR-23-GP measures the glycol concentration in the regeneration process.

Standard sensor material can be used in this application. Appropriate equipment with hazardous and intrinsic safety approvals are available when required.

Instrumentation	Description
	K-Patents Process Refractometer PR-23-GP is an industrial refractometer for large pipe sizes and tanks, cookers, crystallizers and kettles. Installation through a flange or clamp connection.
Area classification:	Intrinsic safety and hazardous area approvals available.
Measurement range:	Refractive Index (nD) 1.3200 – 1.5300, corresponding to 0-100 % by weight.