

# Glycol-based Dehydration Technology



Glycol TEG Dehydration Package

## Product Definition

Natural gas usually contains a large amount of water and is typically water-saturated. This water causes several problems for downstream processes and equipment, such as corrosion or freezing in pipelines at relatively high temperatures.

## Product Description

Frames has developed a complete range of glycol-based dehydration solutions to handle the most demanding conditions. By analyzing your gas composition and operating requirements, our team of engineering experts will design, build, and commission a complete drying solution to meet the gas demands of the downstream processes.

Our glycol-based dehydration technology optimizes gas field productivity by efficiently drying the gas stream. In addition, it protects equipment from corrosion and damage caused by ice crystals (hydrates) that can form at relatively high temperatures.

### Select from a range of glycols

Frames Glycol-based Gas Dehydration Systems use liquid desiccant technology to efficiently remove water from natural gas and carbon dioxide. Building on more than 30 years of industry experience, our engineers are able to specify the best glycol system to fit your requirements and optimize field performance.

This includes using the common glycols diethylene glycol (DEG), tetraethylene glycol (TREG), and the more widely-used triethylene glycol (TEG).

### Minimized energy consumption

Our glycol-based dehydration systems typically include efficient, energy-saving technology such as heat exchangers and the reuse of flash gas for stripping. Moreover, a smart balance between packing height, glycol purity, and glycol amount allows you to benefit from minimized utility consumption levels.

### Low foaming and no need for chemical pH control

Foaming due to condensation of hydrocarbons usually causes glycol loss as well as reduced plant capacity. Our systems are designed to stop heavier hydrocarbons from condensing and forming foam at the top of the structured packing, thus minimizing glycol loss.

Frames systems are also carefully designed to operate at a low skin temperature of the reboiler heater bundle to prevent unwanted glycol degradation. This design feature eliminates the need to use chemicals to control fluctuations in system pH associated with the degradation of glycol.

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Gas Dehydration Towers

## Process Description

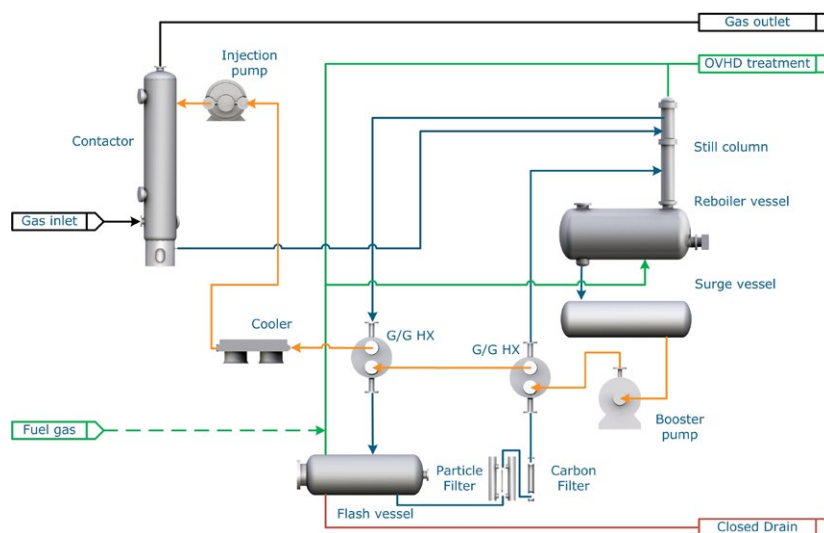
Your Frames Glycol-based Dehydration Unit mixes lean, water-free glycol with wet natural gas in the top of an absorber (glycol contactor), to dry the gas by physical absorption.

This drying process occurs on the surface of structured packing, towards the bottom of the column. The dry natural gas then leaves the top of the contactor column ready for use. The wet glycol, often referred to as “rich glycol”, is drawn off from the bottom.

From the contactor, the rich glycol is routed to the regeneration package for purification. Here it is first preheated using heat from the reflux condenser at the top of the reboiler’s still column, along with heat from the lean/rich heat exchanger. The heated glycol then enters the flash vessel for the three-phase separation of gas, glycol and condensate. At this point it is also filtered to remove any solid contaminants caused by corrosion, scaling or minor glycol degradation.

Afterwards, the warmed rich glycol is fed into the stripper (also known as a regenerator) which consists of a still column, an overhead condenser, and a reboiler. Here it is thermally regenerated to remove excess water and to regain the high glycol purity.

To optimize energy use, the hot clean and lean glycol is used to preheat the incoming rich glycol in the heat exchanger, before being pumped up to operating pressure and cooled ready for reuse in the contactor.



# Glycol-based Dehydration Technology

## Project Management

At Frames, we look at the bigger picture. Our team of in-house experts works with our clients to understand their business, striving to create optimized solutions that ensure a competitive edge.

From optimizing production to cutting operating costs, we work to fully integrate our Frames solutions into your production system within budget, on time and according to specifications, for years of trouble-free operation.

We understand your expectations for high performance, and use industry-leading project management and document control to design, construct and commission high-quality products where and when you need them. Our centralized engineering and construction teams in the Netherlands work together to find effective solutions for each unique project. Our global network of offices, suppliers, and trusted service providers enables us to accomplish the most challenging projects.

## Technical Details

- **Efficient system for removing water from wet natural gas and CO<sup>2</sup>**
- **Protection of downstream processes against corrosion and clogging**
- **Range of glycols including DEG, TREG and the widely-used TEG**
- **Low energy design with efficient heat exchangers**
- **Full glycol filtering and regeneration system**
- **Low foaming design and no need for chemical pH control**

## Added Value Frames

- **Built for your unique business needs and operating conditions**
- **Smart design philosophy eliminates the need for chemical injectors**
- **Skid-mounted units that easily integrate into your production system**
- **Low energy demands with optimized heat integration technology and low emission systems**
- **Robust and reliable units designed with lean engineering methods, using high-end materials**

## References

- **Edvard Grieg - Lundin, Norway**
- **Quad 204 FPSO - BP, United Kingdom**
- **Utorogu NAG 2 - Shell, Nigeria**
- **Khurais - Saudi Aramco, Saudi Arabia**

## Contact

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# Frames Family Tree

