

*Oil & Gas Treatment Systems*



## Oil & Gas Treatment Systems

Escher Process Modules (Escher) has built up a worldwide reputation in the oil and gas industry for the design, fabrication, installation and commissioning of Oil & Gas Treatment Systems. The range of Oil & Gas Treatment Systems supplied include dew point control, glycol regeneration/recovery and fuel gas conditioning. Based on our many years of service to the oil and gas industry, we have the experience and technology to provide our client with fit-for-purpose process installations. The Oil & Gas Treatment Systems are designed for ease of maintenance and cost effective and efficient onshore and offshore operation. Notably, packages for offshore are engineered for space conservation and weight limitation.

### Dew Point Control

Natural gas and associated gas usually contain a large amount of water and a wide range of hydrocarbon compounds, some of which can condense and form liquids and solid hydrates that can cause problems with pipelines and downstream equipment. To avoid these problems and to meet the customer's gas transportation and storage specifications, the entrained and dissolved liquids must be removed. This can be done in one of three ways:

- Absorption (Glycol Dehydration),
- Adsorption (Solid Desiccant), or
- Condensation (Low Temperature Separation).

Depending on feed gas properties and the extent of dew pointing required, Escher can advise the best technology and will assess the design in order to come up with the optimum design.

The dehydration of CO<sub>2</sub> is fundamentally the same as dehydration of sweet natural gas. There are, however, important differences requiring modifications to the design method such as the saturation water content of CO<sub>2</sub> and mutual solubilities of CO<sub>2</sub> in TEG (Tri Ethylene Glycol) and vice versa.

With respect to the dew point requirement and other customer preferences, Escher's absorber design is based on efficient internals for improved operation, i.e. lower pressure drop, minimised glycol losses, reduced dimensions and reduced weight.

**Gas Dehydration** by glycol is a liquid desiccant technology for the removal of water. Glycols used within this technology commonly include Di Ethylene Glycol (DEG), TetRa Ethylene Glycol (TREG) and Tri Ethylene Glycol (TEG) with the latter as the most used variant. Gas dehydration takes place in an absorber column ('glycol contactor').

**Solid Desiccant** technology is used for the removal of water and hydrocarbons from carbon dioxide natural gas and/or associated gas. The most commonly used solid desiccants for this technology include Molecular Sieve and Silica Gel.

**Low Temperature Separation (LTS)** is a technology for the removal of both water and hydrocarbons from natural or associated gas. Temperature control is of the essence in a LTS system. In addition to determining the type and amount of inhibitors, Escher's design focuses on cold conservation and heat integration in order to optimise the total energy consumption.


Oil & Gas Treatment Systems are supplied with process and mechanical guarantee as well as a guaranteed availability of spare part solutions during the lifetime of the product

### Glycol Regeneration/Recovery

For dehydration and/or inhibition, commonly used glycols include MEG, DEG and TEG (Mono/Di/Tri Ethylene Glycol). TEG is the most commonly used glycol in absorption systems and MEG is the most commonly used glycol in glycol injection systems. Recovery of the glycol will make usage more economical. Glycol is recovered in a regeneration system which system's configuration allows for the different types of glycol to be distinguished. Glycol entering the system contains water and dissolved hydrocarbons. Hydrocarbons are separated in a three vessel separator and the water is boiled off thus increasing the purity of the glycol. The recovered glycol can then be directed back into the process.







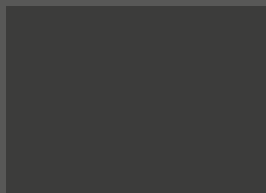
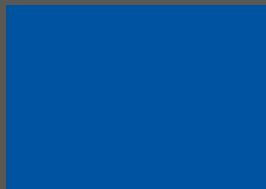
Requirements of the glycol (i.e. quantity and purity) are closely related to the design of the TEG contactor and LTS system. Escher's design focuses on the overall optimum balance between these systems considering sizing, weight, utility consumption and stable operations. The system is designed to avoid foaming and fouling of the glycol and minimise the energy requirements with the use of heat exchangers.

We work with our clients from the feed study to commissioning and start-up



#### Fuel Gas Conditioning

Fuel gas is conditioned to ensure gas is free of liquids and solids. This is particularly critical in gas turbine applications where severe damage may be imposed on the turbine if the gas is not clean and dry. Fuel gas is normally required at a steady operating pressure and at a safe margin above dew point. Escher's design includes all required equipment such as separation vessels, filtration packages, heaters/coolers and instrumentation (i.e. control valves). All equipment is fitted into a complete module for the provision of clean, dry gas at the required pressure and temperature from an untreated, unregulated gas source.



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