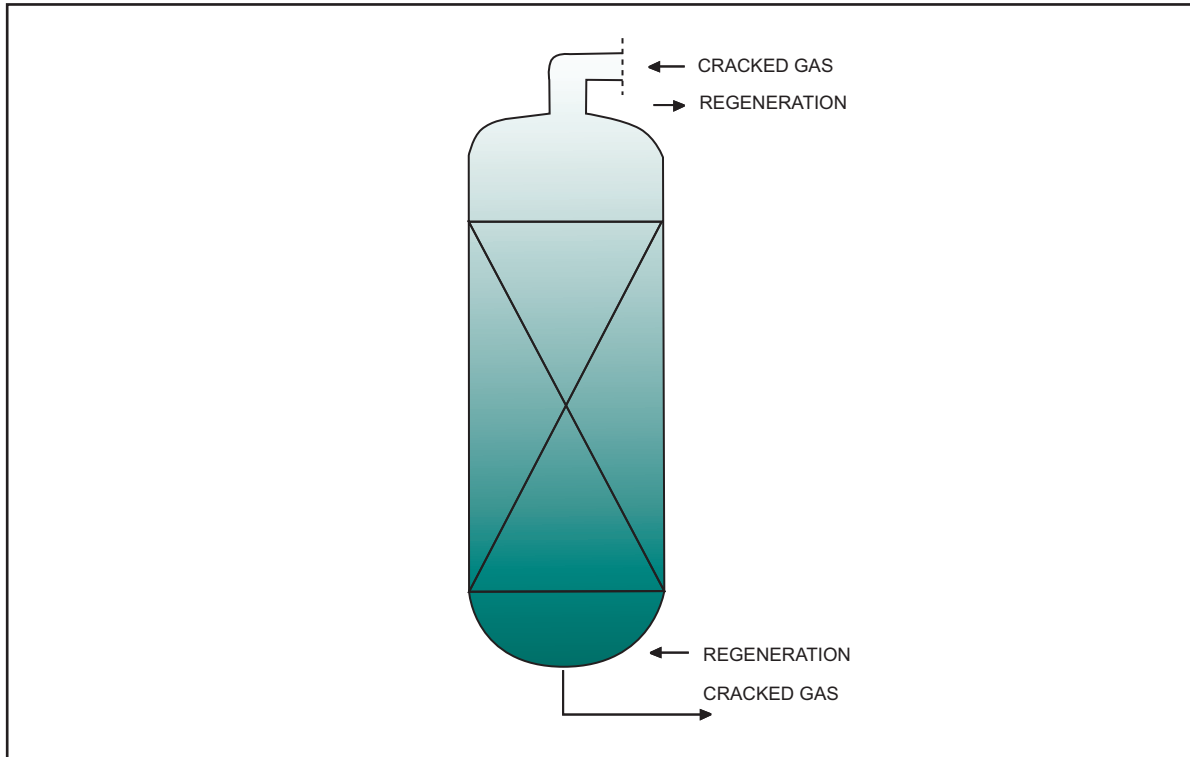


Charge gas drying



Introduction

In the ethylene plant, the feedstock gas is steam cracked, quenched, compressed and washed. Before the gas enters the final stage of separation into the various desired components, moisture must be removed.

It is necessary to remove the moisture from the charge gas before it enters the fractionator, as the fractionator distilling process is done cryogenically, and moisture would reduce process efficiency through formation of ice particles. Adsorptive bed dryers are used, with beds or towers in parallel, which are switching between adsorption and bed regeneration modes.

The Process

Adsorptive bed drying works on the principal that certain porous materials like activated charcoal, silica gel (also called desiccants) and alumina can cause large amounts of vapors to condense on their surface. The vapour is sent through the adsorptive bed until a sufficient amount of liquids is condensed out. This is the adsorption mode.

When the desiccant is fully saturated, the bed or tower switches to bed regeneration mode. The liquids are then driven off the adsorbent by a desorbant such as steam or another hydrocarbon. They are then collected and condensed. After the regeneration mode, the bed switches back to adsorption mode.

APPLICATION REPORT

The number of bed dryers depends on the capacity of the plant, yet in every case there are at least two in parallel, to assure a continuous supply of dry gas.

Definitions

Adsorption: separation according to size or type, making use of the difference in adhesion to porous materials (gas/solid and liquid/solid systems). Adsorbing differs from absorbing because the liquid remains on the surface rather than being absorbed into the medium.

Desiccants: drying medium

The information provided in this bulletin is advisory in nature, and is intended as a guideline only. For specific circumstances and more detailed information, please consult with your local automation expert at Metso.

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