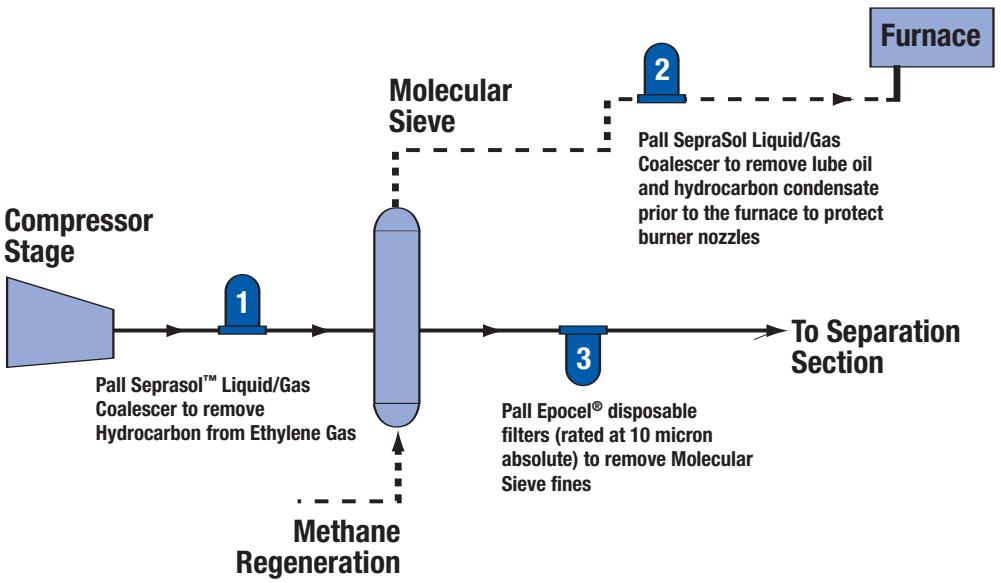
PALL Fuels and Chemicals

Ethylene Processing – Molecular Sieve Protection

Ethylene Compressor and Molecular Sieve System



Application Background

Pall Seprasol™ Liquid/Gas Coalescers when used upstream of a molecular sieve bed, contribute to a proven three year dessicant life. Ethylene producers are known to get less than three years when using knock-out pots and mist eliminators to protect the bed.

When ethylene gas is compressed and exits the compressor, and as cooling takes place, hydrocarbons will condense into a very fine aerosol mist which is very difficult to separate with knock-out drums or packed vessels. Hydrocarbon condensates, and/or wash oils from the compressor, can greatly reduce the performance and life of a Molecular Sieve adsorbent bed. The life of the Molecular Sieve resin is largely dependent on the number of regeneration cycles it undergoes in service. Each cycle subjects the sieve to temperature rises and pressure decreases which vaporizes any hydrocarbon on the sieve and cracks the surface structure of the sieve. These cracks and fissures cause attrition and often result in expensive replacement of the Molecular Sieve material.

Some common problems observed include:

- Frequent regeneration cycles
- Adsorption performance loss
- Premature replacement of the Molecular Sieve material due to attrition and high delta pressure within the bed
- Higher energy costs

Pall Solution

A Pall Seprasol Liquid/Gas coalescer in the ethylene gas lines after the knock-out drums will remove virtually all of the entrained liquids in the gas. Pall Seprasol coalescers can remove both hydrocarbons and aqueous aerosols and are efficient at removing aerosols as small as 0.1 micron. Most aerosols smaller than 5 micron are not separated in knock-out drums or packed vessels.

All of Pall's Seprasol coalescer products contain a patented oleophobic/hydrophobic treatment that allows the coalescer to recover quickly from upsets and capture slugs of liquid more efficiently. The installation of a Pall Seprasol coalescer prior to the Molecular Sieve beds can dramatically improve the reliability and maintenance cost of the Molecular Sieve beds and other downstream equipment.

HCP Filter Recommendations

Filter Location	Recommended Pall Assembly	Purpose of Separation	Benefits of Separation
1	Pall Seprasol™ Liquid/Gas Coalescer: CS604LGH13 CC3LG02H13	Removes condensable hydrocarbons and water from ethylene gas product stream to protect the Molecular Sieve	Reduces lube oil contamination Reduces hydrocarbon contamination Improves adsorber efficiency Reduces regeneration Reduces absorbent costs Improves energy efficiency
2	Pall Seprasol Liquid/Gas Coalescer: CS604LGH13 CC3LGO2H13	Removes condensable hydrocarbons and water from Molecular Sieve regeneration gas stream to protect the fuel gas stream	Reduces lube oil contamination Reduces hydrocarbon contamination Protects burner nozzles Reduces maintenance costs Improves energy efficiency
3	Pall Epocel® II Cartridges 10 µm absolute	Removes Molecular Sieve fines and protects downstream equipment	Improves overall performance Improves product quality

References

GAS4102	Seprasol Liquid/Gas Coalescer
GAS4104	Seprasol Liquid/Gas Coalescer (Double Open Ended Style)
E54	Seprasol Plus Liquid/Gas Coalescer
GAS4500	Operations and Installation Guide to Seprasol Coalescer Assemblies

Other Applications

Applications throughout the entire ethylene process:

1. HCP24 – Removal of Pyrolysis Gasolines from the Dilution Steam System
2. Removal of water and/or caustic from pyrolysis gasolines
3. Removal of “Red Oil” from spent caustic
4. HCP27 – Protection of Burners and Combustion Equipment

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