



Ammonia Plant

PROBLEMS

In ammonia processing plants, the production of high grade ammonia is based on several specifications. One of the specifications monitored is the oil content in the ammonia. The source of the ammonia is generally compressor lube oil systems. These compressors often discharge small quantities of lube oil into the synthesis gas and recycle gas and, unless removed, the oil remains in the process often times resulting in off-specification ammonia.

Another problem can exist in the CO₂ removal step of an ammonia plant. Here a circulation liquid (amine or hot carbonate) is used to remove the CO₂. Because the liquid absorbs an acid, the environment in the circulation system is highly corrosive. Unless efficiently removed with an effective filtration system, the corrosion materials will result

in plugged trays in the CO₂ removal system, reduced CO₂ removal efficiency and high losses of amine or carbonate solution.

PALL SOLUTION

For removal of the lube oil from the system, Pall offers two solutions. The installation of a SepraSol™ Liquid/Gas coalescer at the discharge of the synthesis gas compressor will remove any lube oil that carried over from the compressor. All of Pall's SepraSol coalescer products contain a patented oleophobic/hydrophobic treatment, which allows the coalescer to recover quickly and capture more efficiently slugs of oil that result from the upset conditions that frequently occur in the ammonia units. It is important in this step to make sure that the coalescer is installed at the coolest point in the line. If the temperature is

Figure 1: Ammonia

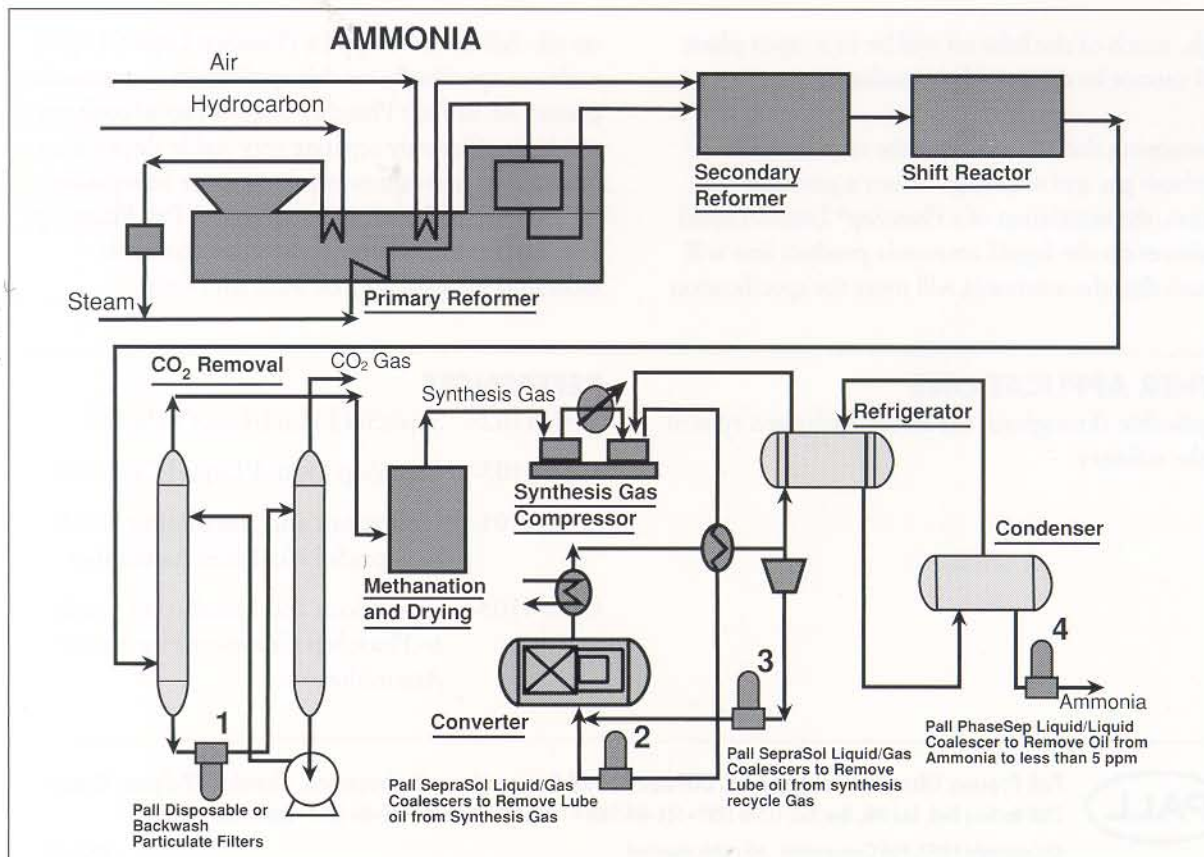


Table 1. Filter Recommendations

Filter Location	Recommended Pall Assembly	Purpose of Separation	Benefits of Separation
1	Pall Disposable or Backwash particulate filters.	Remove corrosion material from circulation liquid	<ul style="list-style-type: none"> • Improve CO₂ removal • Lower maintenance cost • Improved reliability • Reduced losses of amine or carbonate
2	Pall SepraSol Liquid/Gas coalescer CC3LGB7H13. This product was specially designed for ammonia and amine systems.	Remove lube oil and water from synthesis gas	<ul style="list-style-type: none"> • Improved product quality • Reduced fouling of ammonia converter catalyst • Improved reliability • Improved ammonia conversion • Improved energy efficiency and reliability
3	Pall SepraSol Liquid/Gas Coalescer CC3LGB7H13. This product was specially designed for ammonia and amine systems.	Remove lube oil from synthesis recycle gas	<ul style="list-style-type: none"> • Improved product quality • Reduced fouling of ammonia converter • Improved reliability • Improved ammonia conversion • Improved energy efficiency and reliability
4	Pall PhaseSep Liquid/Liquid coalescer in horizontal assembly Part # LCY2Y2YJ with Profile® prefilter. This product was designed specifically for this application.	Remove lube oil from liquid anhydrous ammonia	<ul style="list-style-type: none"> • Meet product specifications

high, much of the lube oil will be in a vapor phase and cannot be removed by a coalescer.

If removing the lube oil from the recycle of the synthesis gas and recycle gas is not a practical option, the installation of a PhaseSep® Liquid/Liquid coalescer on the liquid ammonia product line will ensure that the ammonia will meet the specification

on oil. Pall has developed a PhaseSep Liquid/Liquid coalescer specifically for this application in ammonia plants. All of Pall's PhaseSep Liquid/Liquid coalescer products efficiently separate very stable dispersions like lube oil from ammonia that cannot be separated by conventional coalescer systems. A Pall PhaseSep Liquid/Liquid coalescer is the most economic technique for separating oil from ammonia.

OTHER APPLICATIONS

Applicable throughout the entire hydrogen system in the refinery

REFERENCES

- GAS 4102– SepraSol Liquid/Gas Coalescer
- GAS 4107– PhaseSep Liquid/Liquid Coalescer
- GAS-4501– Operations and Installation Guide to SepraSol Coalescer Assemblies
- GAS-4503– Operations and Installation Guide to PhaseSep Coalescer Horizontal Assemblies



Pall Process Filtration Company • A Division of Pall Corporation • Hydrocarbon, Chemical, Polymer Group
2200 Northern Blvd., East Hills, New York 11548-1289 • 516-484-5400 • 1-888-873-7255 • Fax: 516-484-0364 • <http://www.pall.com>

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