Filtration Applications in **Catalytic Reforming**

Catalytic reforming is a major process in the petroleum refinery and petrochemical industries. This process converts low octane naphthas into higher octane reformate products for gasoline blending and aromatics rich in benzene, toluene, and xylene with hydrogen and liquefied petroleum gas as a byproduct. With the fast growing demand in aromatics and demand of high - octane numbers, catalytic reforming is likely to remain one of the most important unit processes in the petroleum and petrochemical industry.

The most common type of catalytic reforming unit is semi-regenerative. It has three reactors, each with a fixed bed of catalyst, and all of the catalyst is regenerated in situ during routine catalyst regeneration shutdowns.

Some catalytic reforming units may have an extra spare or swing reactor allowing each reactor to be individually isolated so that any one reactor can be undergoing regeneration while the other reactors are in operation. When that reactor is regenerated, it replaces another reactor which, in turn, is isolated so that it can then be regenerated.

The most modern type of catalytic reformers is the continuous catalyst regeneration (CCR) reformer where the reactors are stacked atop each other. The units are characterized by constant regeneration of the catalyst in a special re-generator and by continuous addition of the regenerated catalyst to the operating reactors.

Common filtration problems in a catalytic reforming process include:

- Condensable hydrocarbons in both recycled and net hydrogen can reduce reliability of downstream equipment
- Liquid and solid contaminants in fuel gas lines may damage heater/furnace burner nozzles
- Lube oil contamination from compressor discharge line will decline reactor operations
- Liquid and solid contaminants will lower compressor operation efficiency
- Premature fouling and regeneration of reforming catalyst

Benefits of an Optimized Filtration System include:

- Lower maintenance costs
- Longer burner service life
- Reduced catalyst contamination
- Enhanced reactor operations
- Improved operation and process efficiency

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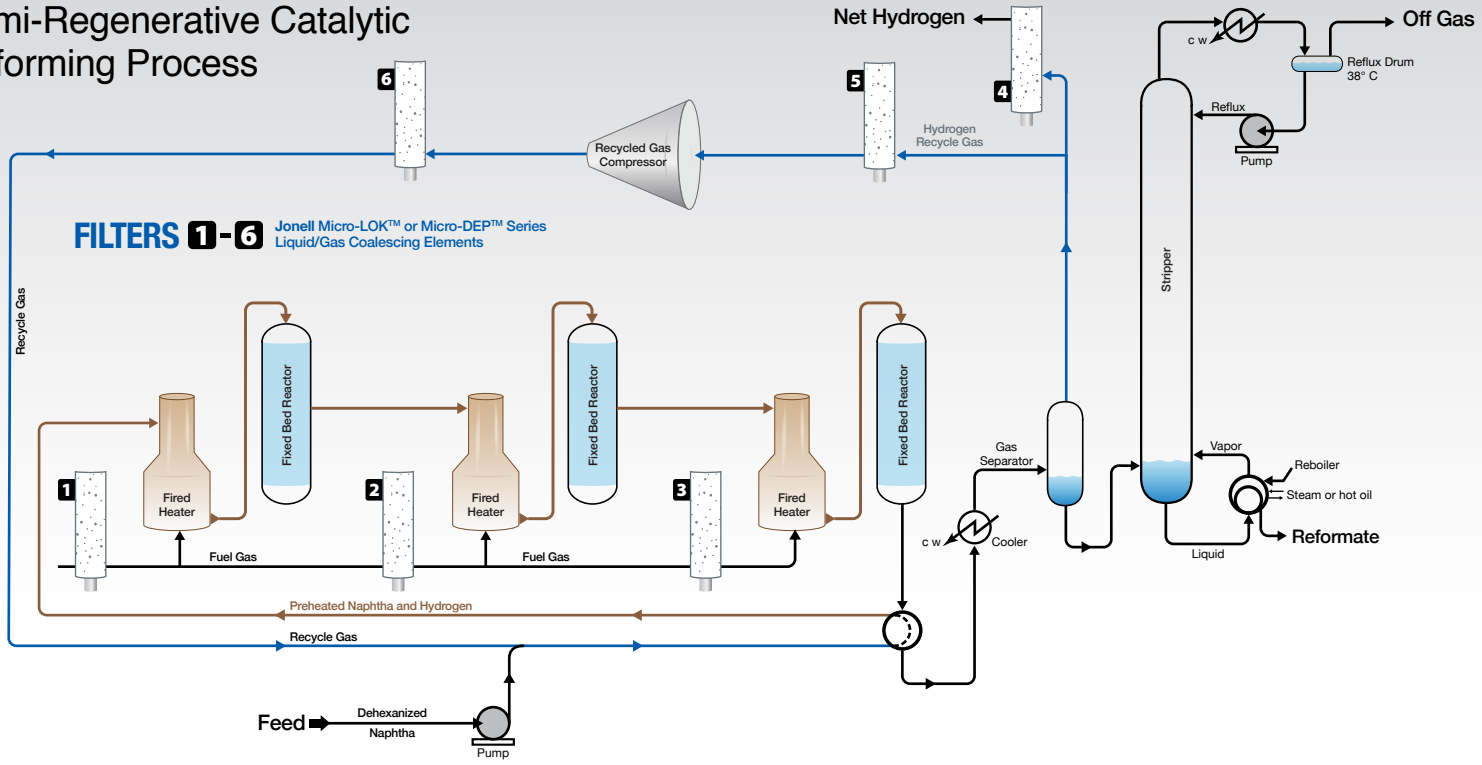
Semi-Regenerative Catalytic Reforming Process



	Jonell Filter Solution	Filter Purpose	Filter Benefit
1-3	Micro-LOK™ or Micro-DEP™ Series Gas/Liquid Coalescers	Removal of liquid and solid contaminants from fuel gas	Improved burner efficiency, longer service life, and reduced maintenance costs
4	Micro-LOK™ or Micro-DEP™ Series Gas/Liquid Coalescers	Removal of condensable hydrocarbons from net hydrogen	Protection of compressor and downstream equipment
5	Micro-LOK™ or Micro-DEP™ Series Gas/Liquid Coalescers	Removal of condensable hydrocarbons from recycled hydrogen	Compressor protection, reduced catalyst contamination, improved reliability
6	Micro-LOK™ or Micro-DEP™ Series Gas/Liquid Coalescers	Removal of lube oil from compressor discharge gas	Lower maintenance costs and improved reactor efficiency

This schematic should be viewed as a general example of where filtration systems could be located within catalytic reforming processes. These processes will vary between companies and facilities. As such, each application should be reviewed and considered individually in order to choose the correct system technology.

Continuous Catalytic Reforming Process