



FILTRATION APPLICATIONS IN ISOMERIZATION PROCESS

Many of the processes in a modern refinery are devoted to improving the octane value of chemical compounds used in blending gasoline. One important process is isomerization which takes low-octane, normal-paraffins and chemically reshapes them into higher-octane, iso-paraffins.

Benefits of an optimized filtration system include:

- Enhanced reactor operation
- Extended catalyst bed service
- Longer burner service life
- Reduction in equipment fouling
- Lower operating and maintenance costs
- Improved operation and process efficiency

Isomerization complements catalytic reforming in upgrading the octane number of refinery naphtha streams. It is a simple and cost-effective process for octane enhancement compared with other octane-improving processes.

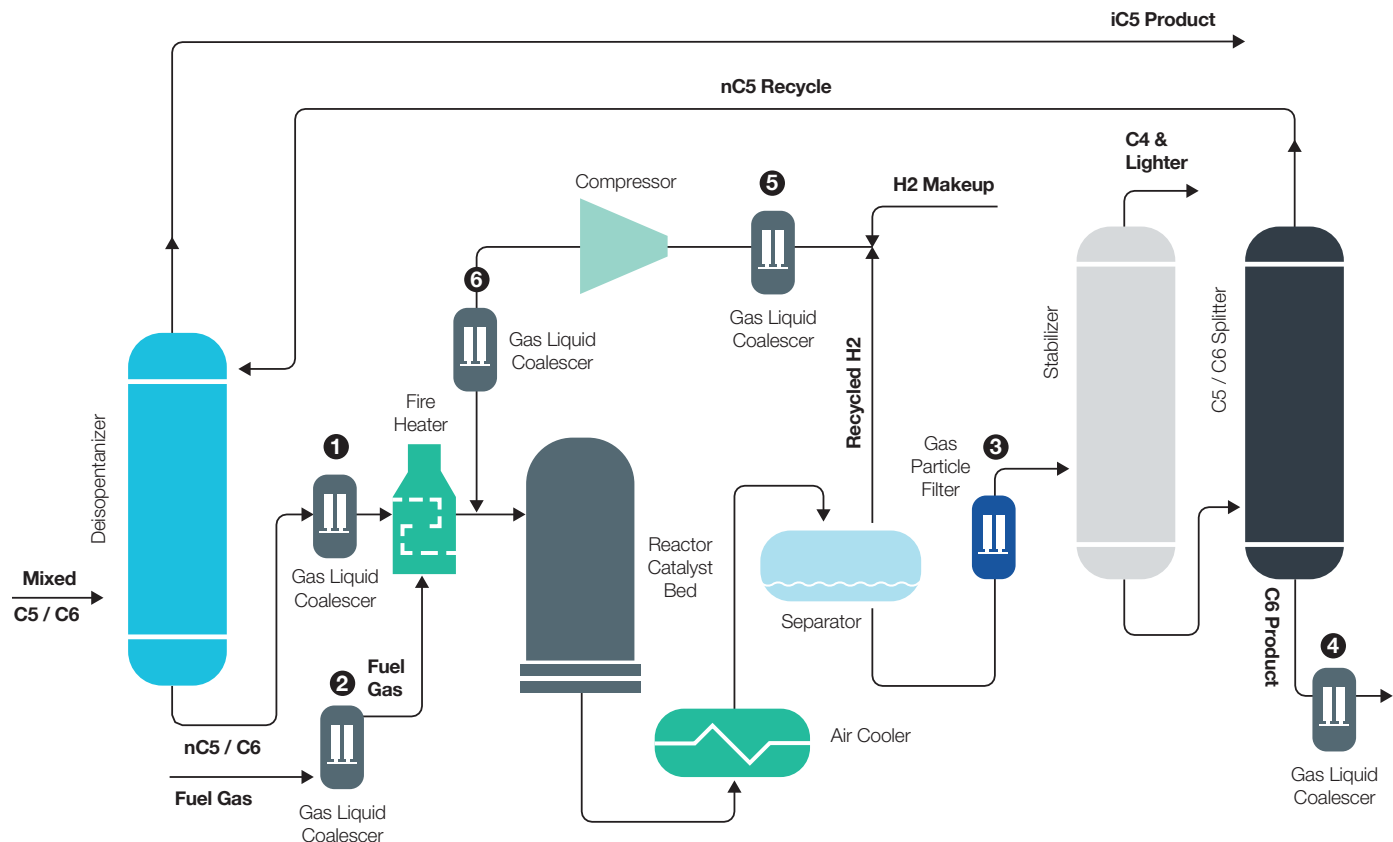
Light straight run (LSR) gasoline, which is mostly pentanes and hexanes, can have its octane number improved by the isomerization process which converts normal paraffins into their isomers. This results in a significant octane increase as normal pentane (nC5) has an octane number of 61.7, while its isomer, isopentane (iC5), has an octane number of 92.3. In a single-pass isomerization, the octane number of LSR gasoline can be increased from 70 to 84.

Isomerization process is also gaining importance in the refining industry due to limitations on gasoline benzene, aromatics, and olefin contents. The process upgrades the octane number of light naphtha fractions while reducing benzene content by saturation of the benzene fraction. Isomerate product contains very low sulfur and benzene, making it an ideal blending component in a gasoline pool.

Common filtration problems in isomerization include:

- Particulate and liquid aerosols will cause premature fouling and regeneration of catalyst bed.
- Catalyst fine contamination will foul stabilizer tower internals.
- 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.
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- Premature fouling and regeneration of reforming catalyst

Filtration Solutions for Isomerization Process



The above schematic should be viewed as a general example of where filtration systems could be located within an Isomerization Process. 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.

	Filter Solution	Filter Purpose	Filter Benefit
01	Micro-DEPT™ and Micro-LOK™ Series Coalescer Elements and Vessel	Removal of particulate and liquid aerosols from deisopentanizer tower	Prevents unscheduled reactor downtime and extends catalyst bed life
02	Micro-DEPT™ and Micro-LOK™ Series Coalescer Elements and Vessel	Removal of liquid and solid contaminants from fuel gas	Improved burner efficiency, longer service life, and reduced maintenance costs
03	GasPleat™ Series Pleated Gas Filter Elements and Vessel	Prevention of catalyst fines from entering the stabilizer	Maintains efficient operation in removing catalyst fines that could foul the stabilizer internals
04	Micro-DEPT™ and Micro-LOK™ Series Coalescer Elements and Vessel	Removal of caustic liquids and particulate carryover	Protects downstream equipment
05	Micro-LOK™ or Micro-DEPT™ Series coalescing elements and vessels	Removal of liquids and solids from recycle hydrogen	Efficient hydrogen compressor operation and significantly reduced maintenance costs
06	Micro-DEPT™ and Micro-LOK™ Series Coalescer Elements and Vessel	Removal of lube oil from compressor discharge gas	Lower maintenance costs and improved reactor efficiency

