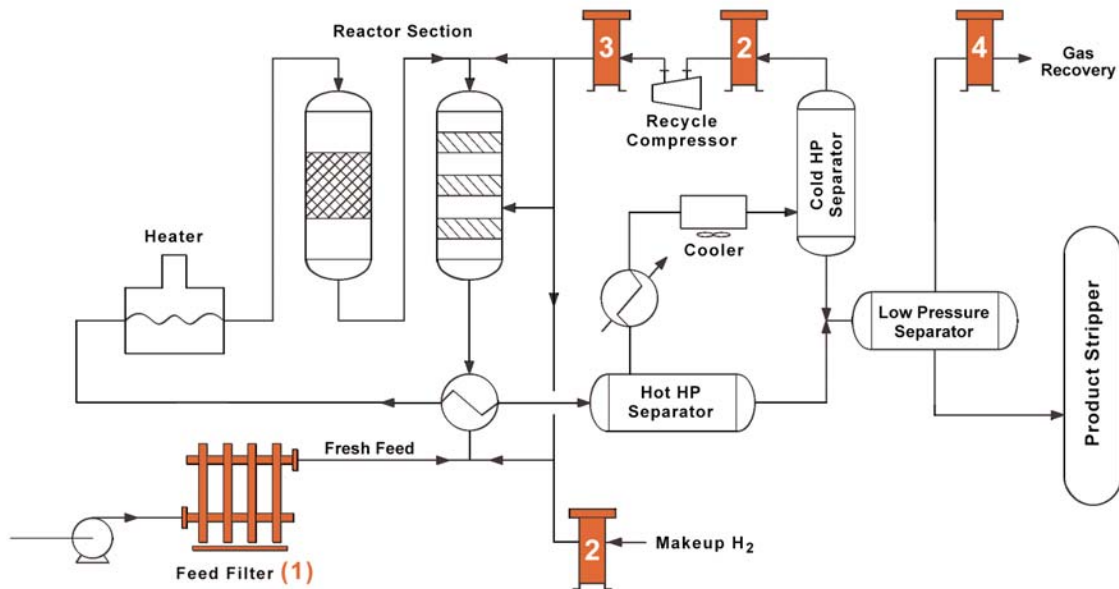




Hydrotreating



Hydrotreating processes are used to reduce sulfur, nitrogen, olefins or aromatics from various feedstocks. In this process the hydrocarbon feedstock is combined with hydrogen and fed through a catalyst bed that speeds and controls the reaction between the feedstock and the hydrogen. Typical feedstocks for the hydrotreating processes are Residual Oil, Gas Oil, Middle Distillate and Naptha. The hydrotreating process upgrades the feedstocks for further processing elsewhere in the refinery.

Operational Problems

1. Heat exchanger fouling
2. Reactor bed plugging or blinding
3. Hydrogen contamination

These operational problems degrade hydrotreating performance and can lead to off-spec. fuels, premature unit shutdown and significantly increased operating cost for the process unit.

Solutions

1. A particulate filter typically located between the process unit feed pumps and heat exchangers will address the fouling and reactor plugging problems. The feed volume and type of hydrocarbon being processed will dictate the type of filter equipment required. The particulate filter may be an automated ProGuard Filtration Systems 4000 Series Feed Filter for moderate to high flow rate conditions or a Nowata Filtration Cartridge Filter for low to moderate flow rate conditions. Typically Residual Oil and Gas Oil Hydrotreaters require at least 25 micron filtration. While Middle Distillates and Naptha typically require 5-10 micron filtration.

2. Hydrogen is continuously recycled in the hydrotreating process. The recycled hydrogen used in the process is recovered from the Cold High Pressure Separator after it is water washed to remove ammonia created in the reactor. A Nowata Filtration Coalescer using 0.3 micron NFF coalescing filter elements should be used to remove carry-over hydrocarbons from the unused hydrogen recovered from the Cold H. P. Separator prior to the Hydrogen Sulfide (H₂S) Absorber and the recycle compressor.

3. A Nowata Filtration Coalescer using 0.3 micron NFF coalescing filter elements should be used immediately after the recycle compressor to remove lube oil from the hydrogen that is introduced during the compression process.

4. A Nowata Filtration Coalescer using 0.3 micron NFF coalescing filter elements should be used to remove any trace hydrocarbon liquids from the overhead gasses removed from the Low Pressure Separator to prevent contamination of the amine in the hydrogen recovery unit.



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