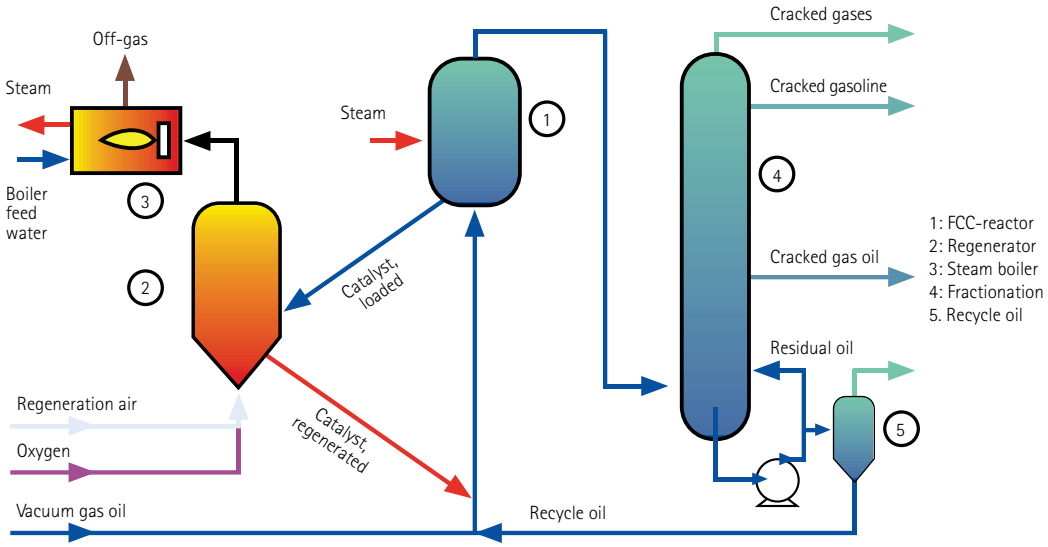
MESSER
Gases for Life

Improving the Performance of FCC Plants by Oxygen Enrichment.



Basic schematic of an FCC plant (FCC = fluid catalytic cracker) showing oxygen input

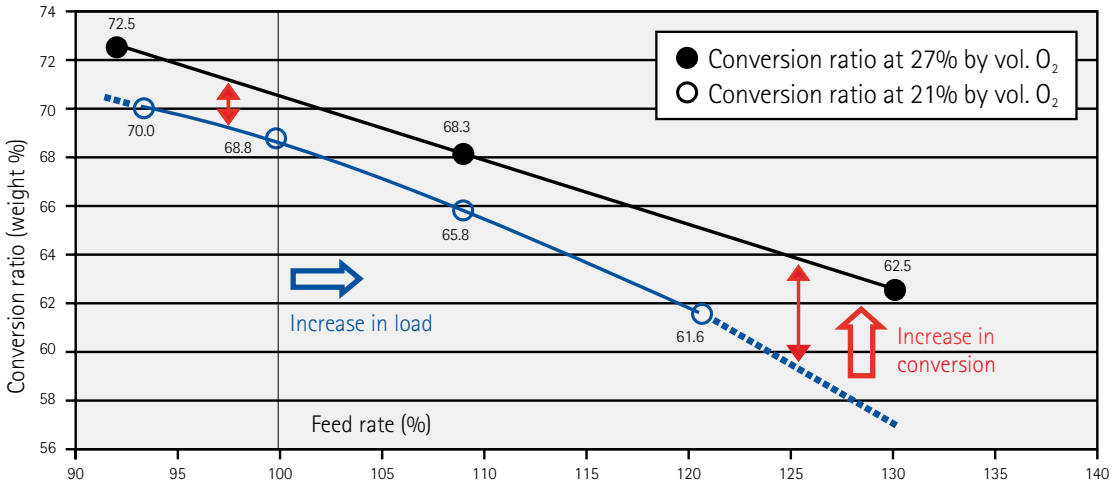
FCC plants are used to convert vacuum gas oil, often mixed with residues from atmospheric distillation, vacuum distillation and visbreaking, into lighter hydrocarbon fractions. The products are a gas fraction (primarily C3/C4), a liquid fraction (primarily gasoline) and coke as a solid. The coke on the catalyst is burnt off during regeneration.

Advantages

Oxygen enrichment during regeneration results in higher plant efficiency because it is then possible:

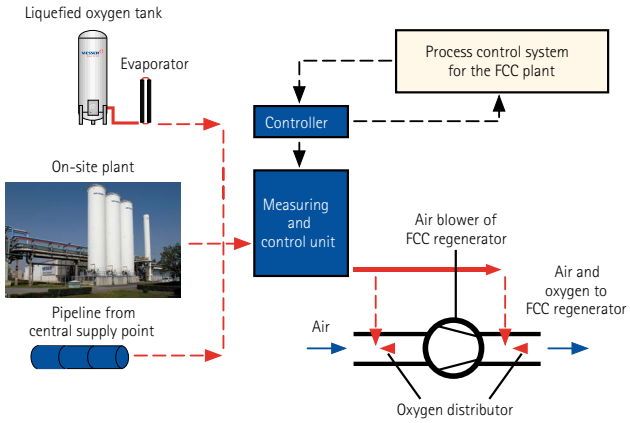
- To increase the capacity of the plant
- To be more flexible in the selection of feedstock, especially to enable use of heavier feedstock with a greater tendency to form coke
- To raise the conversion ratio and the gasoline yield
- To reduce the by-products
- To reduce CO in the regenerator off-gases
- To achieve less abrasion of the catalyst and less erosion of the cyclones for catalyst separation through smaller gas streams

Test results from an experimental plant



Application

The oxygen content in the regeneration air is usually raised to a maximum of 28% by volume.



Schematic of an oxygen supply system for enrichment in an FCC plant

Oxygen supply possibilities

Depending on the oxygen requirement and infrastructure of the refinery, the oxygen can be supplied as shown in the schematic above:

- By a liquid supply system
- By an on-site plant
- Through a pipeline

Liquefied tank supply is used when the oxygen requirement varies strongly. An on-site plant is economical when oxygen is required continuously at throughputs of 20,000 scf/h and more. It delivers oxygen in a purity of 90% to 94% by vol.

Messer FCC oxygen enrichment service offer

- Investigation of the optimum needs of the oxygen supply and distribution in FCC plants
- Estimated profitability calculations and analysis
- Finalize design of oxygen enrichment system
- Contruction of the custom designed oxygen distributor
- Installation and integration of the oxygen supply system in the process control and safety system of the FCC plant by way of a measuring and control unit
- Installation of the equipment for oxygen supply and start-up
- Supply of oxygen
- Verification of system operation and effectiveness
- Evaluation of tests with the customer's oils and residues in a test FCC plant

Further publications on our complete range of products are available in all our sales offices. Please consult our specialists for advice.

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