



UltraMix™ Hydroprocessing Reactor Internals

Refining

UOP recognizes that the performance of a hydroprocessing unit and the length of each cycle depend significantly on vapor / liquid distribution within the reactor. Accordingly, UOP continues to devote considerable time and resources to improving hydroprocessing reactor internals technology.

Recent advancements

UOP proudly introduces UltraMix internals, which significantly improve UOP's earlier designs, already established as the industry's finest. These internals use a unique vapor / liquid distributor, made possible through the use of sophisticated mathematical modeling techniques, and use of a state-of-the-art pressurized testing facility. UOP's continued advancements in the design of hydroprocessing reactor internals are aimed at bringing the best technology to its customers, so they can maximize their profits by achieving the best possible performance from their hydroprocessing units.



The importance of reactor internals

Suboptimally designed reactor internals allow channeling, maldistribution, hot-spots, and by-passing, a phenomenon in which a portion of the feedstock passes through a unit without a significant reaction. This implies that the remaining catalyst must work harder in order to meet the unit objectives. Working harder means higher temperatures, higher deactivation, shorter run lengths, poorer product quality, and higher potential for large radial spreads or temperature instability. Any of these factors could subtract months of potential cycle length, result in higher catalyst and turnaround costs, and cause loss of effective asset utilization.

For example, in the production of ultra low sulfur diesel, just 0.1% effective feedstock by-passing could increase catalyst costs and possibly jeopardize the ability to meet product sulfur specifications.

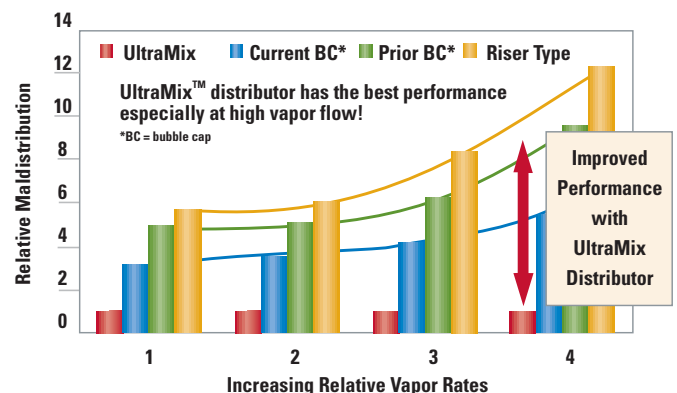


Features and benefits

The key features and benefits of the UltraMix distributor are:

- Low radial temperature differential for improved product quality, longer catalyst life and extended run cycles
- Increased tolerance to “out-of-levelness” and “sagging” for optimal performance throughout a run cycle
- Uniform vapor / liquid distribution over a wider range of operation
- Maximum catalyst utilization and unit run length

Liquid Maldistribution with 1/2” Offset



Refining

The improved design of the UltraMix quench section allows:

- Centrifugal mixing for optimal thermal mixing of quench gas and reactants
- Lower number of parts and improved access for easier maintenance
- Reduced internals height for increased catalyst volume in revamp units and smaller, lower cost reactors for new units.

Ultamix reactor internals solution

Determination of the scope of the UltraMix reactor internals solution begins with a careful analysis of the customer's needs and the conditions of the existing internals. This practice ensures that the solution meets both the customer's budget and processing needs. UOP offers a unique and comprehensive internals solution that combines the engineering, equipment, and services to get the unit up and running as quickly as possible. UOP has successfully supplied this type of design and services package for key process equipment for several hundred projects, including over 80 reactor internals replacement projects. UOP's hydroprocessing reactor internals solution includes:

- Process study for existing and new operations
- Mechanical design review of existing configuration
- Project kick-off meeting
- Fabrication documents and drawings review
- Fabrication consultation to our fabrication partners
- Shop inspection services to ensure that equipment meets UOP's stringent fabrication requirements
- Equipment supply
- Site installation advisor service to ensure proper installation of internals

- Dense catalyst loading, allowing increase in catalyst amount by up to 15%
- Product data book, including complete project documentation
- Project management, coordinating the project from start to finish, and allowing the customer to concentrate their efforts on the turnaround
- Equipment performance guarantee
- Single point of contact for quick resolution of issues

Commercial experience

UOP's hydroprocessing reactor internals are now being used in more than 300 commercial reactors. These include numerous revamp projects, where UOP has successfully replaced earlier generations of internals designed by UOP, as well as internals designed by others.

The first commercial installation of UltraMix internals is scheduled for March, 2003.

For more information

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