Oleflex Reactor

Product Coding
P3XXXXXXXX

Introduction

Oleflex technology is one of the most widely adopted and proven processes for the catalytic dehydrogenation of light paraffins into high value olefins such as propylene and isobutylene. The process operates under severe conditions of high temperature and cyclic operation, requiring reactor systems with exceptional mechanical integrity, precise gas distribution, and long-term reliability. At the heart of this technology, oleflex reactors play a critical role in ensuring stable operation, uniform catalyst utilization, and optimal product selectivity throughout the operating cycle. Euroslot Pars leverages its extensive experience in the design oriented manufacturing of high performance internals and pressure equipment to supply oleflex reactor components strictly in accordance with licensor provided designs and drawings.

Features

- High mechanical strength under extreme temperatures
- Uniform gas distribution across catalyst bed
- Catalyst attrition minimization
- Precise slot/opening control
- Long operating life
- Compatibility with licensor specifications
- High reliability in cyclic operation

Manufacturing Capability and Experience

- Manufacturing strictly according to licensor drawings
- Experience with high alloy and exotic materials
- Precision fabrication and inspection
- Shop and field assembly readiness
- Quality control and dimensional accuracy

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FCC (Fluidized Cracking Catalyst) Reactor

Product Coding
P31XXXXXXX

Process Overview

Oleflex process is a continuous catalytic dehydrogenation technology in which light paraffin feedstocks are converted into corresponding olefins over a fixed catalyst bed at elevated temperatures. The reaction is highly endothermic and equilibrium limited, requiring careful control of temperature, pressure, and gas velocity within the reactor. To maintain high conversion and catalyst activity, the process operates in a cyclic mode that alternates between reaction and regeneration, ensuring sustained performance over extended operating campaigns.

Within the reactor, process gas enters through engineered inlet systems designed to achieve uniform radial or axial distribution before contacting the catalyst bed. Even gas flow distribution is essential to prevent localized hot spots, catalyst degradation, and uneven conversion.

The reactor internals including inlet diffusers, catalyst retention systems, and outlet collectors are designed to manage high thermal stresses, minimize pressure drop, and protect the catalyst from mechanical damage during operation and regeneration cycles.

Spent catalyst is periodically regenerated in a separate regeneration system to remove coke deposits and restore activity, after which it is returned to the reactor. Throughout this cycle, the mechanical design of the reactor and its internals must accommodate repeated thermal expansion and contraction while maintaining dimensional stability and sealing integrity. The oleflex reactor system therefore represents a carefully engineered balance between process performance, mechanical robustness, and long term operational reliability making precision manufacturing of reactor components a critical success factor for the entire plant.

Construction Considerations

Oleflex reactor is mechanically designed to operate reliably under severe service conditions, including high temperatures, cyclic operation, and hydrogen-rich environments. The reactor shell and internals are engineered to maintain structural integrity while ensuring precise alignment of catalyst zones and internal components. Special attention is given to flow distribution devices, supports, and retaining systems to guarantee uniform reactant contact with the catalyst bed. Material selection and fabrication practices are carefully aligned with licensor specifications and applicable international standards to ensure long-term performance, safety, and ease of maintenance throughout the reactor's operating life.

Catalyst System and Flow Distribution

Oleflex reactor is designed with a highly engineered catalyst containment and flow distribution system to ensure maximum process efficiency and reliability. The reactor typically operates in a radial flow configuration, where process gas flows uniformly through the catalyst bed, enabling optimal contact between hydrocarbons and catalyst particles. Specialized inlet distributors and outlet collectors ensure even flow distribution and minimize channeling, which improves conversion efficiency and extends catalyst life.

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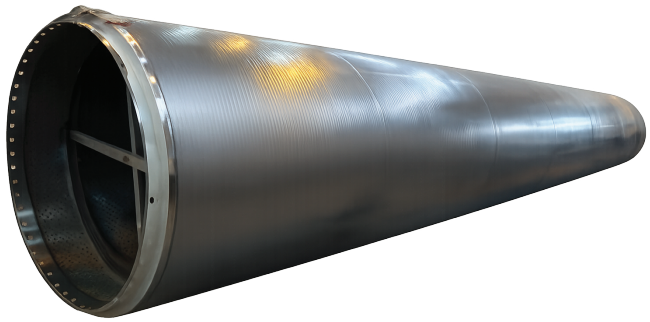
Reactor Internals and Components

- **Feed diffusers:** Feed diffusers are designed to evenly distribute the incoming process gas across the reactor cross section. They reduce velocity gradients and prevent channeling, ensuring uniform flow and optimal catalyst utilization.
- **Outer screens:** Outer screens form the external boundary of the catalyst bed and provide structural containment. They maintain the catalyst in position while allowing uniform radial gas flow through the bed.
- **Inner screens:** Inner screens (center pipes) serve as the internal flow collection surface in radial flow reactors. They allow processed gas to exit or enter the catalyst bed while preventing catalyst movement and maintaining bed integrity.
- **Catalyst support grids:** Catalyst support grids provide a strong and stable platform to carry the catalyst load. They ensure proper weight distribution and allow free gas passage with minimal pressure drop.
- **Plug/gas distributors:** Plug or gas distributors ensure controlled and uniform distribution of process gas into the reactor. They help eliminate dead zones and improve overall reactor efficiency and performance.
- **Outlet collectors:** Outlet collectors collect the processed gas after it passes through the catalyst bed. They ensure smooth flow transition while retaining catalyst particles securely inside the reactor.
- **Regeneration screens:** Regeneration screens are designed to withstand high-temperature regeneration conditions. They maintain catalyst containment and ensure proper gas distribution during catalyst regeneration cycles.
- **Scallops and baskets:** Scallops and baskets are used to control and balance gas flow within the reactor. They help optimize flow distribution, reduce maldistribution, and enhance overall reactor performance.
- **Catalyst transfer pipe:** Specially designed pipe that provides a controlled passage for continuous catalyst movement between reactor sections. It ensures smooth catalyst flow, minimizes attrition, and maintains proper circulation during operation and regeneration.
- **Cover plates:** Structural plate installed above the catalyst bed to protect internals and ensure proper flow distribution. It provides mechanical stability, prevents catalyst displacement, and supports uniform process conditions inside the reactor.



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Applications

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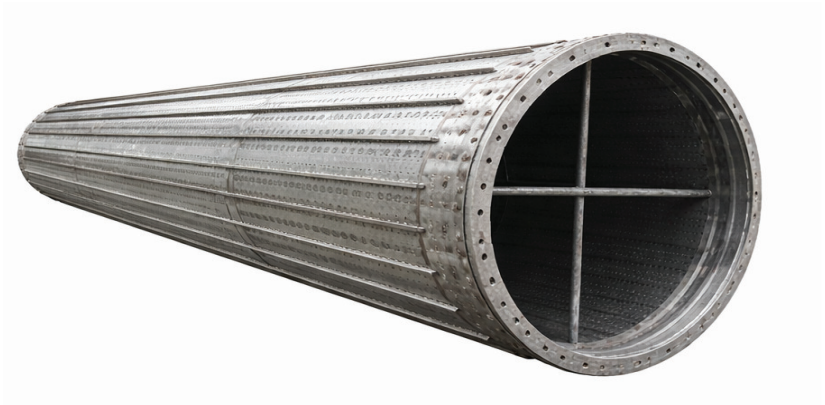

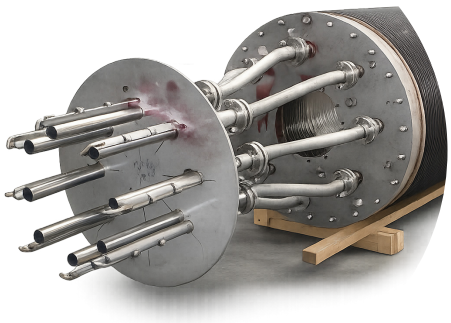

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