

CleanCat™: A revolution in catalyst change-outs

Mourik LP

Given the refining industry's cyclical margin, today's refiners are looking into ways of maintaining reasonable margins to recover the investments they have made, dating and justifying additional investments to cope with a changing market. To reach production goals and objectives, catalysts are critical to many industrial reactions.

Refineries and chemical plants rely on them to help boost product yields and reduce the proportions of unwanted by-products and contaminants. Over time, however, the effectiveness of a catalyst declines. The loss of catalytic activity and/or selectivity is known as catalyst deactivation, and it can be caused by chemical, thermal or mechanical problems.

Mourik, a Dutch-based catalyst handler, has developed a revolutionary method to transport high volumes of catalysts in a closed system from ground level to the top of the reactor. Conventional loading methods use flow bins or super sacks filled with catalysts that are transported to a loading hopper on top of the reactor by crane. This loading method has speed limitations and safety risks when making lifts over workers or live operating units. Mourik's CleanCat™ eliminates these safety risks.

How does it work?

CleanCat is a dense phase pneumatic conveying system for catalyst change out services at fixed-bed reactors in the refining and petrochemical industry. The system is developed to transport large volumes of catalysts from ground level to the top of a reactor where it can be loaded by conventional techniques like sock or dense loading. Dense phase pneumatic technology is suitable for transporting difficult, abrasive or friable materials and pushes material along a pipe in a plug form at relatively low velocities. Almost the maximum pipe volume is used, which makes it possible to transport large volumes of catalysts in combination with a low velocity resulting in minimal impact on the catalyst.

The CleanCat system involves a dense phase conveying feeding unit at ground level to convey the catalyst to the top of the reactor. At the top, a special dual-purpose "catalyst controller" (CDC) controls the velocity of the catalyst in the rigid pipe tower.

This CDC allows the catalyst to fall by gravity in a receiver hopper, which is followed by a discharge sock or dense load machine like conventional methods. For unloading, the process is reversed and the control unit forms part of the system where the conveying speeds of the catalyst is controlled.

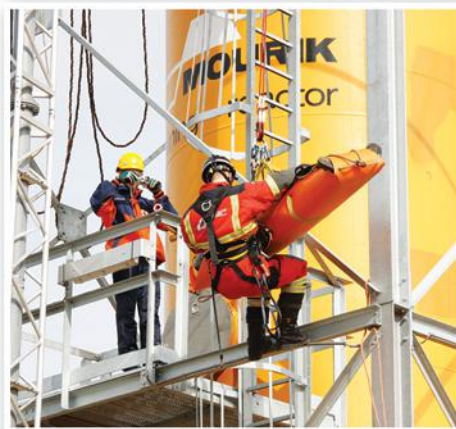
The impact on the catalyst is defined by two types of attrition — creation of dust and fines, and the creation of short particles. Dust and fines are commonly interpreted for catalyst with a nominal diameter of 1.3-1.5 millimeters (mm) as everything that will pass through a 1-mm-by-1-mm screen. As

implied in the name, this category actually consists of two parts, where the distinction is somewhat arbitrary.

In addition to the catalyst — inerts (ceramic balls) — need to be reloaded. CleanCat has been designed to load and unload catalyst as well as ceramics. Even

large size balls where the voids in between normally give problems to create air tide plugs for dense phase conveying can be handled with CleanCat.

For more information, visit www.mourik-usa.com, call (281) 479-4449 or e-mail sales@mourik-usa.com.



Mourik — Catalyst Division

The Best in the Industry

Mourik LP specializes in catalyst handling services for industrial applications, utilizing its innovative technology and proven expertise to secure contracts with some of the largest oil companies in the world.

Why Mourik?

Mourik is an innovative family business that combines traditional human values with modern entrepreneurship, sophisticated technologies, inspiring leadership and a proactive attitude.

Catalyst Services

- Catalyst change-outs
- Unloading & reloading of tubular reactors
- Dense loading activities
- Inspections, repairs & reactor revamps
- Mechanical work
- Reactor cleaning
- Video inspections
- Hole watch / Fire watch



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