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HCAT®: One Technology, Many Advantages

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HTI's HCAT® Technology Featured at International Upgrading Conference

An update on HTI's unique HCAT Technology for heavy oil upgrading was presented by Lee Smith last month at Euro Petro Consultants Ltd.'s "9th International Bottom-of-the-Barrel Technology Conference" in Dubrovnik.

Adding the proprietary HCAT catalyst to an Ebullated Bed (EB) residue upgrader enables EB operators to:

- Increase resid conversion
- Increase resid feed rate
- Take advantage of lower-cost, but lower-quality feedstocks
- Improve product properties
- Improve unit reliability and on-stream time, resulting in better cost-efficiency

Last year, Neste Oil and HTI announced a successful long-term commercial HCAT trial at the Neste Refinery in Porvoo, Finland. From the initial trial to the present, the HCAT liquid catalyst has had a significant, positive impact on hydrocracker operations allowing Neste to raise reactor temperatures (increasing conversion by up to 10 more wt% points versus previous baseline operations) while at the same time increasing throughput.

In addition to these advantages, sediment in the resid byproduct was consistently held at or below refinery specifications. Because of these advantages, Neste confirmed its plan to continue using HCAT on an ongoing basis in early 2011.

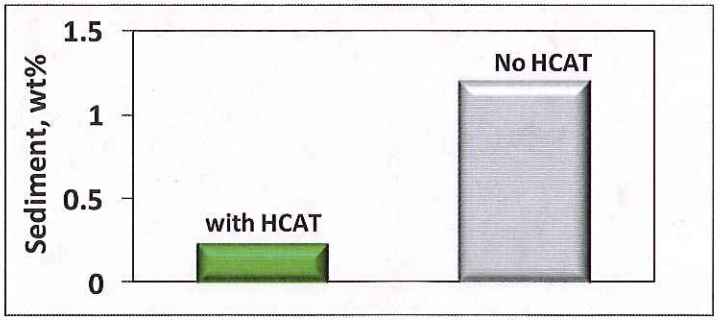
Other EB hydrocracking plants, having an opportunity to process low cost, low quality residues, are forced to impose temperature and throughput limitations to avoid frequent and costly maintenance shutdowns.

When introducing these highly asphaltenic feedstocks, EB operators must deal with sediment, coke precursor, and fouling issues. HCAT reduces the severity of these issues, often saving enough in lost operating time to cover the cost of the HCAT catalyst. Additional value gains come from improved product qualities, higher conversion and/or more throughput.

The HCAT Technology has the potential to provide a broad range of economic benefits to bottom-of-the-barrel hydrocracking facilities. To find out how HCAT can help your upgrading needs, please contact HTI at: HCAT@headwaters.com

Product sediment with HCAT (green) and without HCAT (gray)

Pilot plant test with "opportunity crude" blend (20% Urals; 80% Middle Eastern)



Molybdenum in Fuel Oil ... No Worries!

Unconverted residual oil, which contains most of the metals found in the original crude , is often sold as fuel oil. Burning this oil, however, requires careful planning to prevent the corrosive effects of some metals. For instance, the corrosive threat of sodium is handled by oil washing before combustion while the threat of oxide-forming metals is handled by the addition of chemical additives during combustion. Vanadium, usually the worst offender, reacts with oxygen to form oxides that can deposit on the surface of hot components and cause corrosion . This problem is removed by neutralization with additives which convert metal oxides into high melting salts. These salts are removed with the ash which remains after combustion.

When residual oil is upgraded with HCAT, the molybdenum component of HCAT becomes part of the fuel oil product. Fortunately, this should not be a matter of concern. Molybdenum forms less-corrosive oxides than vanadium does, and therefore can easily be controlled by existing procedures and equipment which control vanadium-oxide corrosion. In addition, electrostatic precipitators and wet scrubbers are in widespread use today and will further ensure that molybdenum emissions are maintained well below environmental limitations.

Any facility currently processing a vanadium-containing fuel oil will be able to accept fuel oil containing the spent HCAT catalyst without worry.