

## Neste Oil, HTI Announce Successful HCAT Demonstration

Technical data from a multi-week commercial plant trial were jointly presented by Neste Oil and HTI at the Euro Petro Consultants Ltd's "8th International Bottom-of-the-Barrel Technology Conference" in London this past October.

Joni Kunnas, Development Manager at the Neste Oil refinery in Porvoo, Finland, described how adding HTI's unique HCAT<sup>®</sup> liquid catalyst to the residual oil feedstock in Neste's ebullated bed hydrocracker enabled them to:

- Raise reactor temperatures so as to effect a net conversion increase of +10% over their prior (base) level.
- Hold sediment in vacuum tower bottoms product at or below "target" despite the higher conversion level.
- Increase hydrocracker throughput by 5 tons/hr.

Reactor operations remained stable throughout the trial, while fouling of downstream equipment was measurably less with HCAT in use.

### What is HCAT?

In simple terms, HCAT enables a refiner to convert more bottom-of-the-barrel residue into higher-value distillates.

Specifically, HCAT is a proprietary technology in which HTI's catalytic agent, introduced with the resid feed, is chemically activated within the reactor system. The combination of solid catalyst in the ebullated bed reactor with the well dispersed catalytic HCAT material enhances hydrocracking of the entire resid feed - including large, asphaltenic molecules - yet with fewer side reactions, and far less coke precursor and byproduct formation.

### What's next?

Neste Oil is continuing its use of HCAT in 2011. A second refinery with a large ebullated bed upgrader began a trial with HCAT in late 2010, and plans to continue in 2011.

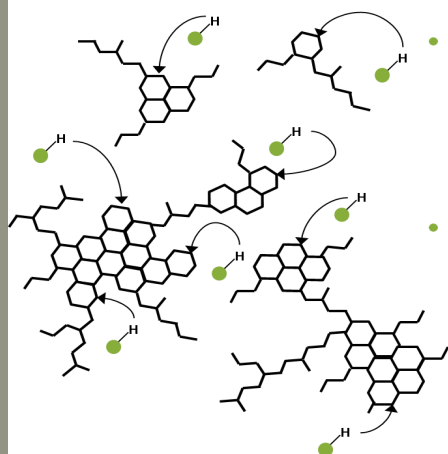
Ebullated bed units around the world, and certain other high-pressure resid hydrocrackers, can benefit from the addition of HCAT. New resid upgrading projects in the early development stage should also consider incorporating HCAT in their design to reach higher levels of conversion than previously thought possible.

### HTI Partnered with Criterion on HCAT

HTI has teamed up with Criterion Catalysts & Technologies to help oil refiners maximize clean fuel production from heavy residual oil.

Under the Criterion-HTI alliance, the proprietary HCAT Hydrocracking Technology is offered in conjunction with the advanced residue upgrading catalysts available from Criterion for ebullated bed hydrocracking. The highly dispersed, oil-soluble HCAT catalyst facilitates hydrogenation, even for very large asphaltenic molecules, enabling more efficient application of Criterion's state-of-the-art resid hydrocracking catalysts.

### How Does the HCAT<sup>™</sup> Catalyst Work?



- Molecular-scale catalyst promotes hydrogen transfer to large asphaltenic hydrocarbons

- Works in parallel with solid catalyst to maximize the hydrocracker's full potential

● = HCAT Molecule