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HP-COAT: Technology for Single Step Conversion of Crude to Olefins & Aromatics

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Abstract

Traditionally, crude oil undergoes distillation, with the Vacuum Gas Oil (VGO) fraction being upgraded through Fluid Catalytic Cracking (FCC) to produce gasoline and light olefins. However, as the demand for fuel decreases and the demand for petrochemicals rises. Hence, worldwide refiners are either going for integration of refinery units or going for crude to chemicals to maximize light olefins and BTX.

Crude to chemicals technology is again broadly the integration of multiple units. Integration of units can yield up to 30% light olefins and BTX. Nonetheless, this necessitates higher capital and operational expenditures, more plot space, and results in increased CO2 emissions.

To address the need for technologies targeting light olefins, HPCL has developed HP-COAT (**H**industan **P**etroleum-**C**rude to **O**lefins and **A**romatics **T**echnology). This innovative process uses FCC based technology to convert crude oil directly into valuable olefins and aromatics, achieving over 50 wt% yields of light olefins and BTX with almost nil bottoms make. The technology includes specially designed reactor hardware to maximize light olefin yields and utilises used/waste catalyst in the process.

The technology has passed through the stage gate process of technology development and has been successfully demonstrated at pilot plant level. After successful pilot-scale demonstration, the basic engineering and design package for an 80 KTPA (kilo tonnes per annum) demonstration unit is complete and the project activities are in progress for installation in one of our own refineries in the eastern coast of India. Expect the project mechanical completion by March 2026.