

DIESEL HYDROTREATING TECHNOLOGY

Introduction

Diesel Hydrotreating is a major technology today with legislations enforcing improved diesel quality specifications. Presently, the technology is closely guarded and available only with few international licensors.

This technology is jointly developed and licensed by IndianOil and Engineers India Ltd. (EIL). It employs improved hydrodynamics and high active hydrotreating catalyst. The technology offers the flexibility to upgrade middle range straight run distillates, coker gas oil streams and light cycle oil from catalytic cracking to low sulphur, high cetane diesel suitable for meeting ULSD (Ultra Low Sulphur Diesel) pool requirement.

Process Description

- Diesel feed is mixed with recycled hydrogen over a catalyst bed in a trickle bed reactor at temperature of 290-400°C and pressure of 35-125 kg/cm².
- The main chemical reactions are hydrodesulphurization (HDS), hydrodenitration (HDN), aromatic and olefin saturation.
- Reactor effluent is separated into gas and liquid in a separator. Gas is recycled back to the reactor after amine wash along with make-up hydrogen and liquid is sent to the stripper for removal of light gases and H₂S.

Salient Features

- Novel & efficient distributors to ensure uniform radial temperature distribution across the bed.
- Cetane improvement by >10 units
- Reactor design based on in-house hydrodynamic models for predicting pressure drop and liquid hold-up.
- Optimized feed preheat scheme offering cost-effective designs considering both capital and operating costs.
- High active catalyst system of IndianOil R&D. however, flexible to use other commercial catalysts.
- Process design based on pilot plant testing with actual design feed.
- Continued support including pilot plant testing in post start-up period and optimization, revamp and trouble-shooting studies.

Commercialization

A grassroots unit of 1.2 MMTPA DHDT commissioned at IndianOil's Bongaigaon Refinery in August 2011 for producing diesel meeting BS-IV norms (Sulphur <50 ppm and Cetane number of > 51).

Advantages

- Indigenous development and use of indigenous know-how in process design and engineering, hence, technology cost is lower than competitors.
- Capable of producing ultra low sulphur meeting EURO-V diesel specifications.
- Efficient reactor internals.



1.2 MMTPA DHT unit at IndianOil's Bongaigaon Refinery

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