

INDMAX Technology

Higher yields of Light Olefins / LPG & High Octane Gasoline from Heavy Hydrocarbon Streams

Demand for propylene is continuously increasing and it is envisaged that propylene market share will grow faster. Production of propylene from conventional sources can no longer meet the demand in such scenario. On the other hand, the demand of heavy distillate (fuel oil) is decreasing. Therefore, the biggest challenge for Refiners is to upgrade the residual streams / bottom of the barrel to lighter & valuable products for improvement in Refinery profit margin.

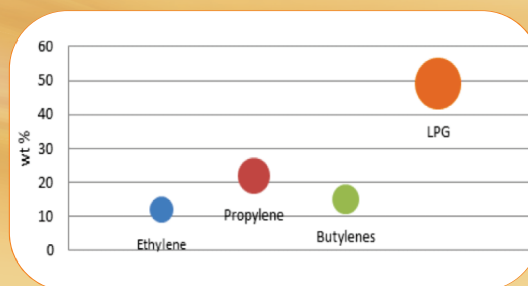
INDMAX, a flagship technology developed by IndianOil R&D helps refiners to produce higher yields of light olefins / LPG and high-octane gasoline from various resid / non-resid feedstocks. Due to its capability in achieving higher conversion along with selectivity towards lighter olefins, implementation of this technology enables seamless integration of refinery with petrochemicals complex.

INDMAX employs circulating fluidized bed Riser-Stripper-Regenerator configuration similar to conventional FCC technology with single-stage full combustion Regenerator system. The catalyst system, operating conditions and hardware components employed in INDMAX process are customized to achieve desired products and process is different from the conventional FCC technology.

Currently, INDMAX technology is being licensed worldwide by M/s Lummus Technology LLC, USA in collaboration with IndianOil.

Salient Features

- INDMAX technology employs proprietary catalyst system having higher metal tolerance, higher selectivity towards light olefins and lower dry gas yield
- Higher conversion and better heat balance is achieved through high efficient hardware components such as Micro-Jet™ Feed injector, ModGrid® stripper internal, Direct-coupled cyclone separator, MSO™ air distributor, etc.
- With the combined effect of INDMAX Catalyst and hardware design, the unit is designed with single-stage full burn Regenerator for high CCR feedstocks upto 6 wt% without catalyst cooler.



Typical light olefins yield, wt% of feed



Major Benefits

- Gasoline from INDMAX unit is having higher octane number (RON > 95) as compared to conventional FCC and extraction of Toluene & Xylene from gasoline helps improve refining margin
- Capable of handling wide range of feedstocks as well as operation in different modes to maximize propylene yield or gasoline yield depending on Refiner's objective
- Robust and high performing design of INDMAX unit based on proven experience of more than three decades in research, technical services, revamp, troubleshooting, optimization, etc. along with wide operating experience of Catalytic Cracking units
- Equipped with Pilot plant facilities, advance testing & catalyst evaluation facilities

Commercial Experience

Commissioned units

- 100 KTA unit commissioned in 2003 in one of the Indian refineries, which was subsequently revamped to 150 KTA in 2016
- A mega scale unit of 4.17 MMTPA for production of propylene as feedstock to petrochemicals complex commissioned in 2015 in India
- A grassroots unit of 0.74 MMTPA capacity with residue feed having CCR ~ 4 wt% has been commissioned in October 2020 in one of the Indian refineries to eliminate black oil production and improve LPG and distillate yields.

Upcoming units

- Four grassroots units of 2-3 MMTPA capacities, handling feeds ranging from hydrotreated VGO to residual feed (CCR ~ 5wt %), are under various stages of design in different Indian refineries. The prime objective of all these units is maximization of propylene as feedstock to petrochemical complex
- Revamp of two-stage RFCC unit to 1.7 MMTPA unit with propylene maximization is under progress in one of the Indian refineries
- Revamp of FCC unit to 0.66 MMTPA for propylene maximization is under progress in one refinery in Europe
- Cumulative capacity of licensed INDMAX units is 17.2 MMTPA (345 KBPSD)



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