



INDMAX Technology

IndianOil Light Olefins Maximization

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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 fast. Production of propylene from conventional sources can no longer meet the demand in such a 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 improving Refinery profit margin.

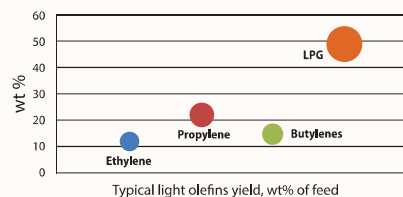
INDMAX, a flagship technology developed by IndianOil R&D, helps refiners to produce higher yields of light olefins / LPG and high-octane gasoline from various resid / non-resid feedstocks. Due to its capability in achieving higher conversion along with selectivity towards lighter olefins, implementation 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 yield desired products and the process is different from the conventional FCC technology.

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

Salient Features

- INDMAX technology employs proprietary catalyst system with higher metal tolerance, higher selectivity towards light olefins and lower dry gas yield.
- Higher conversion and better heat balance is achieved through highly efficient hardware components such as Micro-Jet™ Feed injector, ModGrid® stripper internal, Direct-coupled cyclone separator, MSO™ 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 up to 6 wt% without catalyst cooler.



Typical light olefins yield, wt% of feed



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Major Benefits

- Gasoline from INDMAX unit has a higher octane number (RON > 95) as compared to conventional FCC.
- Extraction of Toluene & Xylene from gasoline helps improve refining margin.
- Capable of handling wide range of feedstock as well as operation in different modes to maximize propylene or gasoline yield depending on demand.
- 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 with CCR ~ 4 wt% commissioned in 2020 and Performance Guaranteed Test Run (PGTR) of the Unit successfully completed in December, 2021 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 implementation 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).

