# Maximize PX production while lowering feed and energy costs

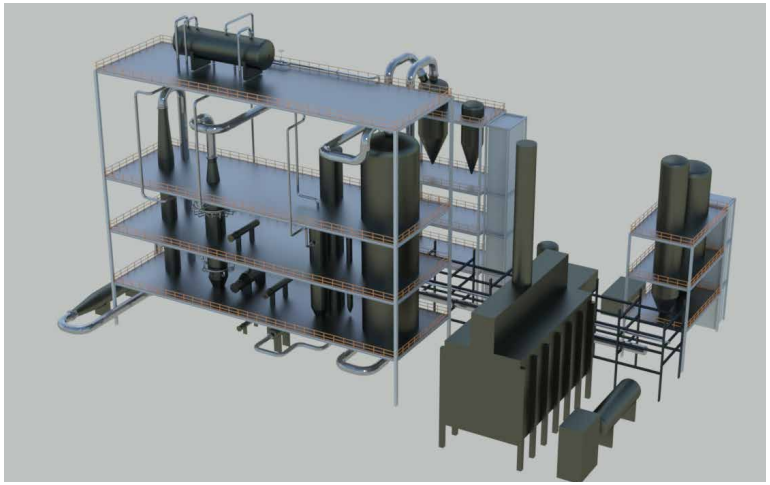
## Delivering stable and consistent high paraxylene selectivity throughout the operating cycle

Energy lives here™

The EMTAM℠ process is a breakthrough technology which maximizes production of valuable paraxylene product while lowering feed and energy costs. The highly paraxylene selective process is built off of commercially proven technologies. Unlike other toluene conversion processes, there is no benzene co-product and no hydrogen co-feed. It is the only process that can tune the methyl to ring ratio based on market conditions and allows unlimited benzene co-feeding to produce paraxylene.

### The EMTAM process

The EMTAM process is a fluidized bed catalytic process that uses low-cost and readily available methanol to alkylate toluene and/or benzene to yield a highly paraxylene enriched product with minimized production of other co-products. The image below is the 3D model of a world-scale unit design.



## Key benefits

### Unique process performance

- High selectivity to PX/smaller recovery unit
- Toluene mostly converted to PX, no benzene co-product, no hydrogen co-feed
- Lower feed and energy costs
- High toluene conversion per pass
- High methanol incorporation into xylenes
- Stable and consistent product yields
- Low sensitivity to poisons (continuous regeneration)

### Multiple options to achieve high value

- Product slate flexibility – ability to co-feed benzene when in an integrated complex and upgrade benzene to PX when market conditions favor PX production.
- Ability to maximize PX product or minimize crude feedstock when used in a crude to chemicals complex - approximately 30% more PX or 30% less crude feedstock providing massive savings across the complex (capital, energy, feedstock)
- Ability to use ExxonMobil's LPI process (liquid phase isomerization) to lower energy costs even further

## The EMTAM℠ process; highly selective to PX, lower feed and energy costs, stable and consistent yields

The EMTAM process which is highly selective to PX uses a proprietary selectivated zeolite catalyst which is continuously regenerated to ensure stable and consistent product yields throughout the cycle. The fluidized bed process also features high toluene conversion per pass, optimized process conditions (toluene to methanol ratio, water co-feed, superficial velocity...) and a proprietary staged methanol injection system aimed at maximizing methanol utilization for the methylation reaction and minimizing by-products formation. When the toluene methylation unit is close to an ethylene facility, the off-gas can be upgraded to higher-valued olefins products. The EMTAM process lowers feed and energy costs which represent ~75% of the operating cost in a state-of-the-art naphtha to PX complex.

## Tested and proven technology:

**Fluidized bed process derived from FCC technology**

- Based on 75+ years of ExxonMobil experience with FCC process
- Process conditions very similar to FCC (pressure, temperature, fluid solids circulation)
- Peripherals identical to FCC (stripper, cyclones, cat cooler, slide valves, transfer lines)

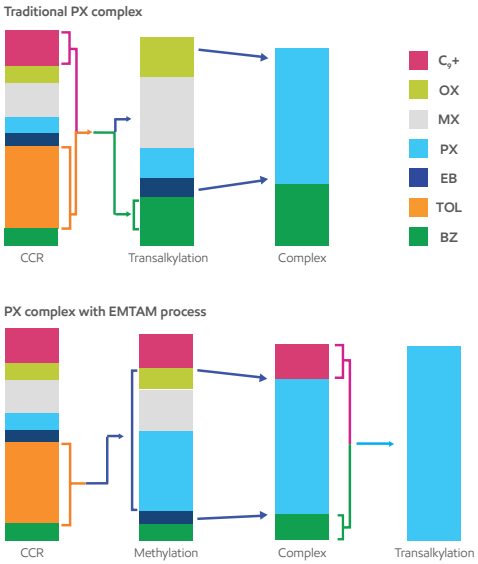
**Demonstrated performance**

- 10+ years pilot plant operation
- ~1 full year of 8 Bbl/day Process Demonstration Unit operation
- Commercially produced catalyst

**Reliable design**

- Reviewed and approved by 4 world-class engineering companies
- World-scale unit design complete
- Multiple world-class fabricators qualified by ExxonMobil to construct vessel and internals

## Maximizing aromatic rings to paraxylene:




- 30% more PX production with the same feed basis

**or**

- 30% less feed for same PX production

## Support from initial consultation throughout the life of the operation:

- Initial discussions to confirm client objectives and tailor the solution
- Detailed Yield Estimate
- Feasibility Study
- Commercial Proposal
- Process Design Package
- Technology transfer, training, catalyst loading and start-up support
- Technology improvement
- Performance monitoring and technical assistance throughout the life of the catalyst

The process is highly selective to PX which reduces product recovery costs and is capable of feeding both toluene and benzene in any ratio. In an integrated complex, this feedstock flexibility allows you to upgrade benzene to PX when market conditions favor PX production over benzene. The EMTAM process is also licensed by Axens as part of the ParamaX® technology suite for grassroots aromatics complexes.

## About us

ExxonMobil helps refiners and petrochemical manufacturers increase capacity, lower costs, improve margins, reduce emissions and operate safe, reliable and efficient facilities. Along with a commitment to helping to implement best practices and to achieve better results, we provide cutting-edge proprietary catalysts and license advantaged process technologies for refining, gas and chemical needs.

Lower feedstock and energy costs, reduced cost of the PX recovery section, and 30% less crude oil feedstock or 30% more PX in a crude to chemicals complex.

Collaborate with us today.
**catalysts-licensing.com**



L0518-095E49