



Maximize PX production while lowering feed and energy costs

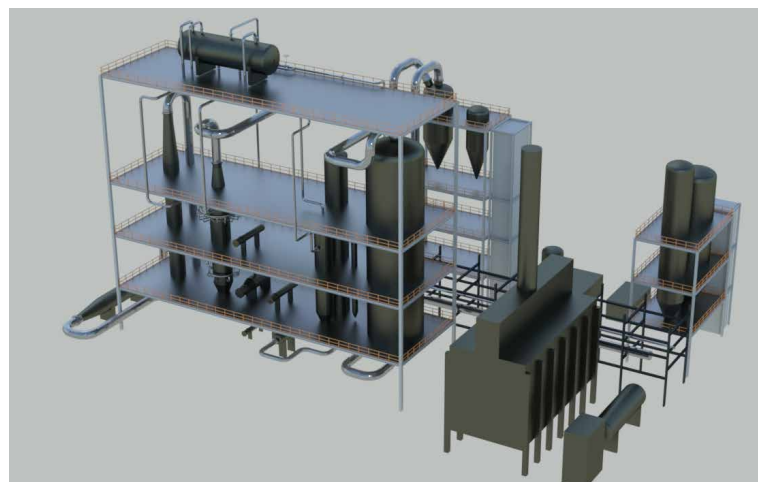
Delivering stable and consistent high paraxylene selectivity throughout the operating cycle

Energy lives here™

The EMTAMSM 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)

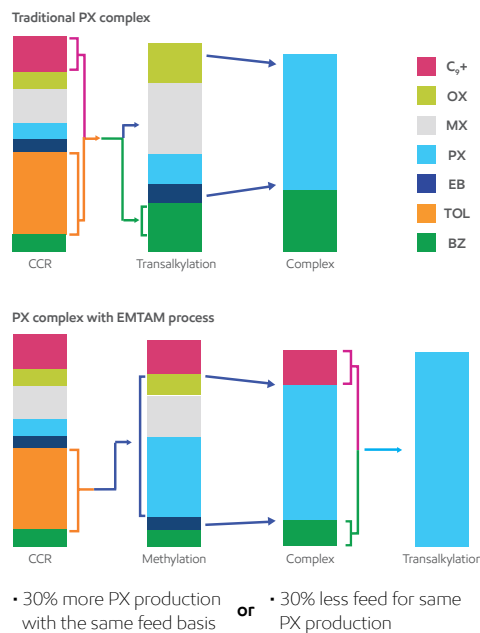
Demonstrated performance

- 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:



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

©2018 ExxonMobil. ExxonMobil, the ExxonMobil logo, the interlocking "X" device and other product or service names used herein are trademarks of ExxonMobil, unless indicated otherwise. This document may not be distributed, displayed, copied or altered without ExxonMobil's prior written authorization. To the extent ExxonMobil authorizes distributing, displaying and/or copying of this document, the user may do so only if the document is unaltered and complete, including all of its headers, footers, disclaimers and other information. You may not copy this document to or reproduce it in whole or in part on a website. ExxonMobil does not guarantee the typical (or other) values. Any data included herein is based upon analysis of representative samples and not the actual product shipped. The information in this document relates only to the named product or materials when not in combination with any other product or materials. We based the information on data believed to be reliable on the date compiled, but we do not represent, warrant, or otherwise guarantee, expressly or impliedly, the merchantability, fitness for a particular purpose, freedom from patent infringement, suitability, accuracy, reliability, or completeness of this information or the products, materials or processes described. The user is solely responsible for all determinations regarding any use of material or product and any process in its territories of interest. We expressly disclaim liability for any loss, damage or injury directly or indirectly suffered or incurred as a result of or related to anyone using or relying on any of the information in this document. This document is not an endorsement of any non-ExxonMobil product or process, and we expressly disclaim any contrary implication. The terms "we," "our," "ExxonMobil Chemical" and "ExxonMobil" are each used for convenience, and may include any one or more of ExxonMobil Chemical Company, Exxon Mobil Corporation, or any affiliate either directly or indirectly stewarded.