



Technology Fact Sheet

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China Coal using Lummus Technology's Olefins Technologies

- Owner :** China Coal Shaanxi Yulin Energy & Chemical Co. Ltd.
- Location:** Yulin, Shaanxi Province, China.
- Process:** Light olefins recovery and olefins conversion
- Capacity:** 600,000 MTA ethylene and 765,000 MTA propylene
- Production:** Polymer grade ethylene and polymer grade propylene
- Technology:** Olefins Recovery Technology and Olefins Conversion Technology (OCT)
- Description:** The Olefins Recovery Technology takes the effluent from a methanol to olefins reactor and processes it to produce polymer grade ethylene and polymer grade propylene products as well as a mixed C₄ product. The mixed C₄ product is sent to a selective hydrogenation unit to hydrogenate small amounts of butadiene, and is then sent to an olefins conversion unit where metathesis chemistry is used to convert the mixed C₄s olefins and a portion of the ethylene produced into polymer grade propylene.
- CB&I Advantage:** The Olefins Recovery Technology uses a unique absorption system to recover the olefins from the hydrogen and methane contained in the reactor effluent without using cryogenic separation, which is more typically applied. This feature ensures safe operation, simplifies the plant and lowers investment. The Olefins Conversion Technology uses metathesis and isomerization chemistry to produce on-purpose polymer grade propylene, which is otherwise primarily produced as a byproduct in ethylene plants and FCC units. The propylene production is accomplished in an energy neutral fashion, lowering energy costs as well as associated greenhouse gas emissions. Integration of the two technologies significantly enhances the return on investment by upgrading the C₄s from LPG value to propylene value.

Lummus Technology, a leader in olefins technology, provides innovations proven in seven methanol to olefins recovery units and 38

licensed olefins conversion units either under design or operating around the world. Plants utilizing these integrated technologies have the highest recovery of ethylene and propylene from the methanol to olefins reactor effluent, with the lowest energy consumption and lowest investment. They are further enhanced by increases in the yield of ultra high purity propylene in the olefins conversion unit, which is the lowest energy and capital cost route to propylene available in the industry today.

Benefits:

Olefins Recovery Technology	
FEATURES	BENEFITS
Absorption System	Inherently safe recovery in streams containing NOx. Low capital cost since all alloy material is eliminated and single refrigeration system is used. Lowest energy consumption. Highest ethylene and propylene recovery.
Quick Start-up	On spec product produced in less than 48 hours in the initial start-up.
Commercially proven	Only olefins recovery technology in commercial operation for methanol to olefins reactor effluent.

Olefins Conversion Technology	
FEATURES	BENEFITS
On-purpose propylene	High yields – High efficiency – Long run-length – Reliable operation – Low investment
High propylene purity	Purity higher than from an ethylene unit
Low energy consumption	Lowest energy route to on-purpose propylene production
Low capital cost	Attractive economics for the process
Commercially proven	Proven in 38 commercial applications resulting in a wealth of operating data

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