



Technology Fact Sheet

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Jilin Utilizing EB/SM Technology from Lummus Technology

- Owner :** Petrochina Jilin Petrochemical Company (Jilin)
- Location:** Jilin, China
- Process:** Ethylbenzene/Styrene Monomer
- Capacity:** 320,000 MTA Styrene Monomer
- Production:** Ethylbenzene/Styrene
- Technology:** Lummus/UOP EBOne Ethylbenzene and "Classic" Styrene Monomer technologies
- Description:** The manufacture of EB involves the alkylation of benzene with ethylene to yield a mixture of alkylated benzenes and excess benzene. This mixture is distilled to recover EB, recycle benzene, and higher ethylated benzenes. The latter are transalkylated with benzene to form additional EB. The recycle benzene is sent back to the alkylator and transalkylator reactor vessels, and the EB product is sent to the dehydrogenation section of the styrene unit. The major reactions in the manufacture of SM are the dehydrogenation of EB to SM and hydrogen.
- Dehydrogenation side reactions produce benzene and toluene and some light compounds. The catalytic dehydrogenation reaction is endothermic, with reaction heat supplied by a superheater. The reactor effluent is cooled by generating steam. The offgas stream is compressed and used as fuel in the steam superheater. The dehydrogenated mixture is distilled to recover SM product, recycle EB, as well as benzene and toluene by-products. Inhibitors are added to prevent styrene polymerization in the process equipment.
- CB&I Advantage:** The Lummus/UOP EBOne ethylbenzene and Lummus/UOP "Classic" styrene monomer technologies have earned the reputation for being the most modern, efficient, and reliable processes for the production of intermediate ethylbenzene (EB) and styrene monomer (SM), respectively.

Benefits:

FEATURES	BENEFITS
EBOne Ethylbenzene	
Long catalyst run-length with excellent stability	Minimizes plant downtime
Highly selective reaction	Insignificant amounts of xylenes are produced, providing highest product quality
High yield	Minimizes production cost
All carbon steel equipment	Reduces investment
“Classic” Styrene Monomer	
Patented azeotropic heat recovery system – Substantial recovery of low-level energy without compression	Increases energy savings
Unique reactor system achieving high single-pass conversions and high selectivities	Reduces investment • Exceptional mechanical reliability
Long reactor run-lengths	Reduces downtime
Low steam/hydrocarbon ratio	Lower production cost

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