



Technology Fact Sheet

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Butadiene Technology from Lummus/BASF used by CJSC Vostochnaya Neftechimicheskaya (VNHK) in Russia

- Own:** CJSC Vostochnaya Neftechimicheskaya (VNHK), a fully owned subsidiary of OJSC Rosneft Oil Company
- Location:** Nakhodka, Primorsky Region, Russia
- Process:** Butadiene
- Capacity:** 200,000 MTA of butadiene
- Technology:** The BASF NMP-based butadiene extraction process, licensed by Lummus Technology
- Description:** The butadiene extraction process utilizes n-methylpyrrolidone (NMP) as a solvent. NMP is less toxic and more stable compared to other solvents, providing the best properties to maximize recovery of butadiene, resulting in high purity butadiene product and low operating costs.
- CB&I Advantage:** The BASF NMP-based butadiene extraction process, licensed by Lummus Technology since 1990, is the preferred technology for the production of high purity 1,3-butadiene from crude C₄ cuts. The technology is successfully applied in more than 30 plants worldwide, with a total capacity exceeding three million tons per year. These advantages minimize start-up costs, maximize production, ensure high profitability, and achieve short payout time. New plants have started up at an average rate of two per year since 1989.

Benefits:

FEATURES	BENEFITS
NMP is non toxic, non carcinogenic and can be treated by conventional biological waste water treatment	Environmentally sound design
NMP and water mixtures are non-corrosive allowing carbon steel equipment to be used without the need for a corrosion inhibitor	Low investment and operating costs
Low solvent losses due to NMP's remarkable resistance to hydrolysis and	Low operating costs • Less fouling

thermal decomposition as well as its high boiling point	
Low energy consumption due to an efficient heat recovery system and optimal process design	Low operating costs
Operating periods exceeding four years without cleaning due to effective fouling inhibitor system	Longer on stream time • Low maintenance costs

About VNHK

CJSC (VHHK), a fully owned subsidiary of OJSC Rosneft Oil Company, was established in 2011 for the realization of Rosneft's petrochemical production in Russia's Primorsky region near the Pervostroiteley settlement of the Nakhodka city district. The enterprise will be engaged in polymers production and will produce a range of other petrochemical products. As part of the project, a specialized sea terminal near Vostochny port is planned for shipment of the finished products.

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