CASE STUDY

A world designed to last



Sanjiang Chemical's Mixed

Successful design of a low-energy mixed feed cracker leads to quick start-up and on-spec products

T.EN TECHNIP ENERGIES



Overview

With extensive expertise in ethylene, Technip Energies' design and technology know-how played a key role in the Sanjiang mixed feed cracker in Jiaxing Port, Zhejiang Province in China. In addition to providing proprietary technology and equipment, our Houston Operating Center team, with support from four other operating centers around the world, performed the process design package (PDP) for the 1,000 kta plant.

1,000 KTA MIXED CRACKER

ON-SPEC ETHYLENE IN 36 HOURS AFTER START-UP

15% LOWER SEC

Challenge

Avoiding Market Risk

Mixed feed steam crackers have the flexibility to crack gas and liquid feeds from multiple sources, allowing them to change feedstock based on cost and availability. Sanjiang Chemical wanted to utilize ethane, naphtha and propane as feeds for its new 1,000 kta ethylene plant to supply polymer grade ethylene to downstream ethylene oxide / ethylene glycol and other derivative units. The plant design helps Sanjiang avoid the market risk of relying on a single raw material with potential price fluctuations.



Technologies

Experience in Mixed Feed Crackers



Technip Energies has extensive experience in the design of mixed feed crackers. In addition, we offer key proprietary technologies, including Ripple Trays™, Wet Air Oxidation and Ultra Selective Conversion (USC®) U and W coil furnaces, which provide high energy efficiency and high yields.

For Sanjiang, this was the first mixed feed cracker that utilized our low-pressure de-ethanizer heat integrated rectifier system (HRS®), which was integrated with a liquid ethane feed refrigeration credit recovery process to provide outstanding energy efficiency.

Solutions



Reducing Energy Consumption

The innovative process design, proprietary technology and equipment used in the Sanjiang mixed feed cracker not only significantly reduced the Specific Energy Consumption of the plant, but also enabled its successful startup that reached on-spec product just hours later.

The plant's C2 hydrogenation system was online and on-spec within 13 hours after initial hydrocarbon feed-in during startup; feed was introduced into the C2 splitter, producing on-spec ethylene, in just 36 hours.

Our Ultra Selective Conversion (USC®) U and W coil furnaces are designed for short-residence time and meet the operational needs of the plant. For the cold section design, we incorporated our proprietary Heat Integrated Rectifier System (HRS®) and low-pressure de-ethanizer for higher energy efficiency. Refrigeration credits were recovered from the ethane and propane liquid feeds.

Results

Successful startup

Technip Energies demonstrated its capability to implement new design concepts to meet our client's needs and adapt to specific circumstances. The Sanjiang project showcased our reliable technology and equipment design to achieve a successful startup with on-spec product shortly after and a 15 percent lower Specific Energy Consumption compared to other mixed feed crackers.

"In today's market, companies need flexibility and reliability when planning ethylene plants. Seeing our innovative approach to Sanjiang's plant achieve such success, we will utilize these features in similar plants."

Jim Middleton

VP Head of Technology – Ethylene

