

Sustainable production of propylene oxide begins at new HPPO complex in China using Evonik-Uhde technology

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- Qixiang Tengda's world-scale HPPO facility comes online under Evonik and thyssenkrupp Uhde license, with tailor-made Evonik catalysts
- On-site hydrogen peroxide megaplant licensed by Evonik ensures high standards for safety, supply security, and quality of the crucial raw material
- Proprietary propylene oxide production method cuts emissions, energy, co-products, and costs

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Zibo City, China. Operations have begun at leading chemical producer Qixiang Tengda's new propylene oxide complex in Zibo City, China, using technology from Evonik and thyssenkrupp Uhde. The technologically integrated setup offers significant ecological and economic benefits compared to conventional production methods for propylene oxide.

With the capacity to produce 300,000 tons of propylene oxide each year, the state-of-the-art complex involves two main plants: One is a world-scale HPPO facility to synthesize propylene oxide directly from hydrogen peroxide using a method licensed from Evonik and thyssenkrupp Uhde. The other is a new hydrogen peroxide megaplant licensed from Evonik to provide the raw material directly on-site. Evonik is also supplying its catalyst specifically designed for the process.

HPPO, or "hydrogen peroxide to propylene oxide," is an efficient propylene oxide production method developed by Evonik and thyssenkrupp Uhde. Through HPPO, propylene oxide can be synthesized directly from hydrogen peroxide without generating any co-products other than water. It is enabled by a catalyst developed and continuously improved by Evonik specifically for this purpose. Through this combination of streamlined chemical process and high-performance catalyst, HPPO slashes energy and resource use, saves emissions, reduces costs, and avoids unwanted co-products compared to conventional propylene oxide production.

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In addition, the on-site hydrogen peroxide megaplant, licensed by Evonik and also running an Evonik catalyst, ensures the highest standards in terms of safety, supply security, and quality of the crucial raw material. More than a century of worldwide expertise in peroxides has made Evonik a global technology leader in hydrogen peroxide, as well as now the first company operating and licensing a hydrogen peroxide megaplant in China.

The reduced environmental impact of this setup is particularly relevant as global demand for propylene oxide is growing steadily: The chemical is needed to manufacture a wide range of daily-use products, ranging from thermal insulation to furniture cushioning and sports equipment. With its annual production capacity of 300,000 tons, the new Qixiang Tengda facility aims to serve China's strong market demand for propylene oxide.

"I would like to heartily congratulate Qixiang Tengda on the startup of the new HPPO and hydrogen peroxide plants and the excellent cooperation," said Lauren Kjeldsen, head of Evonik's Smart Materials division. "HPPO is a prime example of how innovative technology can support greener industrial processes — especially in light of tightening environmental regulations in China. I am especially impressed by the efficiency with which these facilities were built and successfully brought online in those times of pandemic restrictions."

"The Evonik-Uhde HPPO technology is a perfect example for making chemical processes as environmentally friendly as possible. To tackle the complex challenges all industrial sectors are facing, it is mandatory to have the right partners, and we are gladly supporting our customers to reach their environmental and economic targets," remarked Dr. Cord Landsmann, CEO of thyssenkrupp Uhde.

"Our goal was to build an efficient propylene oxide plant by using the most sustainable process technologies and with Evonik and thyssenkrupp Uhde, we found the right partners to achieve this goal," said Che Chengju, General Manager of Qixiang Tengda.

Design and construction of the Qixiang Tengda facility began in the second half 2019 after the three partners signed licensing and supply agreements. Similar Evonik licensing projects are also in preparation or further advanced in implementation.

For more information on HPPO at Evonik, visit: evonik.com/hppo

Company information

Evonik is one of the world leaders in specialty chemicals. The company is active in more than 100 countries around the world and generated sales of €18.5 billion and an operating profit (adjusted EBITDA) of €2.49 billion in 2022. Evonik goes far beyond chemistry to create innovative, profitable, and sustainable solutions for customers. About 34,000 employees work together for a common purpose: We want to improve life today and tomorrow.

About Smart Materials

The Smart Materials division includes businesses with innovative materials that enable resource-saving solutions and replace conventional materials. They are the smart answer to the major challenges of our time: environment, energy efficiency, urbanization, mobility, and health. The Smart Materials division generated sales of €4.83 billion in 2022 with about 7,900 employees.

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