

thyssenkrupp Uhde and Novonesis launch innovative enzymatic esterification technology

- **A more sustainable alternative to conventional esterification**
- **Reduces energy consumption, enhances product quality and safety**
- **Providing bio-based key ingredients for food, personal care, home care and technical products**

thyssenkrupp Uhde, a major chemical technology solution provider, in partnership with Novonesis, our partner and pioneer in enzymatic technology, announce the launch of their joint offering: uhde® enzymatic esterification. This groundbreaking technology bears the potential to revolutionize ester production by significantly reducing energy consumption and enhancing product quality through environmentally friendly biocatalysis, at a competitive cost-in-use of the enzyme.

Esterification plays a crucial role in the oleochemical value chain by converting natural fatty acids into the corresponding esters. These bio-based and bio-degradable esters are then utilized in a wide range of day-to-day products for food, personal care, household care and technical applications.

The new enzymatic esterification process developed by thyssenkrupp Uhde leverages Novonesis' bespoke enzymes as catalysts, replacing traditional chemical catalysts such as inorganic acids or metal-based catalysts. This innovative approach operates at significantly lower temperatures, resulting in substantial energy savings and a reduction in greenhouse gas emissions by up to 60%. Additionally, the process has an inherently safer design due to the absence of chemical catalysts and lower operating temperatures.

"We are thrilled to introduce this innovative enzymatic esterification technology in collaboration with Novonesis. This joint offering underscores our commitment to sustainability and also provides our clients with a competitive edge through enhanced product quality and the possibility to enter completely new markets for bio-based products. Together, we are paving the way for a more eco-friendly and efficient future in chemical production," said Nadja Håkansson, CEO of thyssenkrupp Uhde.

"Our collaboration with thyssenkrupp Uhde brings together the expertise of our two companies and has enabled us to create an innovative technology solution for production of low-carbon esters. By leveraging thyssenkrupp Uhde's process technology know-how and proprietary equipment, a new level of performance is now achievable with our enzymes for ester production. We will collaborate closely with thyssenkrupp Uhde to commercially deploy this new technology," said Hans Ole Klingenberg, Vice President, Global Marketing, Industrial & Household care solutions of Novonesis.

Economic and ecological advantages

The proprietary reactor design and enzyme technology ensure high performance, leading to minimized side reactions and reduced waste by up to 60%. This not only raises the quality of the final product but also opens the door to the creation of completely new products, allowing businesses to expand their portfolios and enter new markets.

The proprietary design of the enzyme bed allows up to 30 circulations per hour which ensures efficient and cost-effective production. Thus, the enzymatic esterification process is optimized for short reaction times, resulting in competitive enzyme cost per ton of product, higher annual production, and superior product quality.

Easy integration and retrofit solutions

To facilitate the transition to enzymatic esterification, thyssenkrupp Uhde offers an add-on retrofit package that allows existing plants to run both conventional and enzymatic esterification processes. This stepwise transition approach minimizes investment costs and risks while enabling businesses to quickly enter the growing market for sustainable products. Already successfully applied in a pilot plant, the technology is now ready for scale-up and industrial application.

About thyssenkrupp Uhde

thyssenkrupp Uhde combines unique technological expertise and decades of global experience in the engineering, procurement, construction and service of chemical plants. We develop innovative processes and products for a more sustainable future and thus contribute to the long-term success of our customers in almost all areas of the chemical industry. Our portfolio includes leading technologies for the production of base chemicals, fertilizers and polymers as well as complete value-chains for green hydrogen and sustainable chemicals.

<https://www.thyssenkrupp-uhde.com/en/products-and-technologies/green-chemicals/enzymatic-esterification>

About Novonesis

Novonesis is a global company leading the era of biosolutions. By leveraging the power of microbiology with science, we transform the way the world produces, consumes, and lives. In more than 30 industries, our biosolutions are already creating value for millions of consumers and benefitting the planet. Our 10,000 people worldwide work closely with our partners and customers to transform business with biology.

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