Advanced PLA technology

Uhde Inventa-Fischer (UIF) specialises in the design and construction of state-of-the-art polymerisation plants that produce high-quality polyesters and polyamides as well as polyactic acid. Its design technologies for the construction of high-standard polymerisation plants are well received in the packaging industry for the company's expertise, efficiency and focus on wide-ranging processes for a high-demand industry.

Part of thyssenkrupp Industrial Solutions, a strong global network creates valuable synergies and enables Uhde Inventa-Fischer (UIF) to cooperate efficiently within the thyssenkrupp Group. The company specialises in a range of technologies that combine engineering expertise, specialist knowledge of polymers and applied experience in industrial applications. Innovation, flexibility and customer orientation are central to the company's business model.

UIF offers excellent technologies in its core competence of the design and construction of state-of-the-art polymerisation plants for polyesters, polyamides and polyactic acid (PLA). These plants are based on proprietary, patented process technologies and key equipment, developed, tested and optimised at its pilot plants and laboratories.

New biodegradable polymers

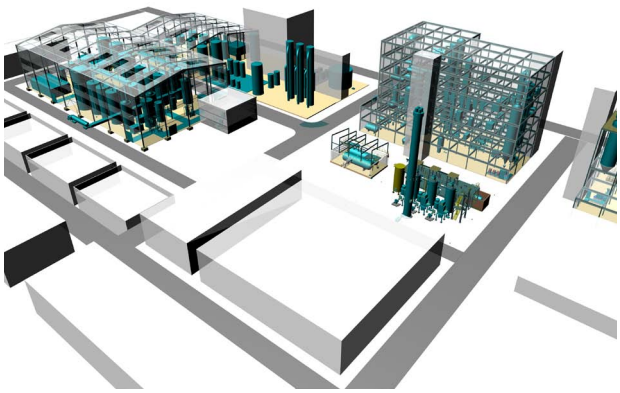
UIF's latest developments include processes for the production of specialised biopolymers such as PLA and polybutylene succinate. These new biodegradable polymers are based on renewable raw materials for a sustainable alternative to plastics based on petrochemicals. They offer huge potential in replacing conventional polymer applications, especially in packaging.

A large number of PLA applications are already on the market, such as the thermoformed articles sold under the name Bioware from the Huhtamaki Group, Danon Activia yogurt cups or Sant'Anna's Bio Bottle. A new biodegradable and bio-based polymer, PLA has to compete with standard petrochemical-based polymers like PET, PS and the polyolefines – not only on a technical, property-related basis, but also in terms of pricing.

Use of the raw material must therefore be efficient, as it has a huge impact on production cost. Here lies the main advantage of UIF's PLAneo process. The conversion of lactic acid to PLA is close to its theoretical minimum, thanks to the unique purification and polymerisation technology of meso-lactide (which usually has to be separated and hydrolysed back to lactic acid, reducing overall efficiency and increasing raw-material-conversion costs). In UIF's PLAneo process, meso-lactide is polymerised and blended with standard crystalline PLA without this adversely affecting the properties of the PLAneo PLA. Some properties, such as elongation at break, are even improved. UIF's PLAneo process can produce all PLA grades available in the market, from fast-crystallising types to nearly amorphous ones.

Integrated technology

UIF has been integrating its knowledge of equipment manufacture, plant engineering and polymer production for almost a century, making it well equipped to meet the demands of today's polymer industry. The company has gained unrivalled experience in the construction and engineering of more than 400 polymer production plants around the world. These include polymer and chemical plants for the manufacture of polyesters such as PET, PBT, PEN and PTT, as well as co-polyester for textile bottle and film grade, and engineering plastics.



UIF constructs state-of-the-art plants for the production of polyesters, polyamides and polyactic acid.

The technologies are developed in UIF's own workshops and pilot plants. In the past ten years, the focus has been on the development of the PLAneo technology. The PLA process fits perfectly into the company's product portfolio as it can be seen as a combination of the polyester and polyamide technology, which means the reactor design and process setup of the PLA technology are based on proven technology.

In addition, UIF is in the position to offer technology for the production of lactic acid from sugar or glucose. UIF's sister company, the biotechnology division of thyssenkrupp Industrial Solutions, has developed the fermentation process at its own industrial-scale pilot plant.

Its status as a world leader in polyamides and polyester plants, with the most advanced PLA technology, is what differentiates UIF from its competitors. With its presence in China, Russia, Saudi Arabia, India, the CIS countries and the Far East – plus the additional expertise of the thyssenkrupp Group – UIF is able to handle complete turnkey projects all over the world. UIF is a flexible company that can license out its processes and patented technologies for production, and provide the complete recipe for its special process technology. Its adherence to many ISO certifications guarantees high product quality. ■

Further information
Uhde Inventa-Fischer
www.uhde-inventa-fischer.com