

FEATURE

Trends in polyolefin plant engineering

High production capacities and increasing globalization call for high-performance plant concepts

For about 70 years, plastics production has been continuously increasing due to the growing global economy, significantly influenced by the demand for plastics in Asian countries and by new areas of application. This also increases the demands on production plants, as manufacturers not only have to expand their production capacities, but also react very flexibly and quickly to the different material properties of various product types. With its plant engineering concept, Zeppelin Systems responds to the demand for high performance and supplies individual complete solutions along the entire value chain from a single source.

The plastics boom is also influencing the production capacities of polymer plants, ensuring that outputs of 500 to 600 kt per year are now almost standard for single-line plants. In order to handle these quantities efficiently, the design of the conveying and logistics systems is elementary.

Technologies as an influencing factor on plant performance and product quality

In polymer production, conveying distances now range from 100 to 600 meters. Hydraulic conveying is suitable for long conveying distances and increasing raw material quantities, because it overcomes almost any conveying distance and at the same time enables throughputs of well over 100 t/h. While some systems on the market operate with pumps in the product-carrying water circuit, the Zeppelin conveying system locates the pump outside the product flow. With the patented Cyclo Feeder, Zeppelin Systems thus guarantees a gentle product feed, as there are no rotating elements in the conveying circuit that cause abrasion or product loss. This ensures the plant operator a very high product quality as well as a larger batch quantity and thus increases productivity. Hydraulic conveying also has a positive balance in terms of operating costs, saving between 60 and 80 percent of energy costs compared to the pneumatic conveying systems.

Another factor influencing product quality is the degassing process. This is because monomers are produced during the production process, for example in the case of LDPE pellets, which in too high a concentration can cause explosions and thus cause major damage to a plant. It is therefore important to remove these already in the silo. The process silos from Zeppelin System offer the highest safety standards in this respect thanks to a stepped cone. With openings in different diameters, this ensures that air can be injected at different points. The gas flows homogeneously over the entire cross-sectional area of the LDPE granulate contained in the silo and thus completely discharges the monomers.

Close to the raw material: the location issue demands high quality from the production plant

Oil and gas are necessary for the plastics production. Therefore, production facilities are often located close to these raw material sources to avoid long transport distances. These are regions with sometimes extreme climatic conditions, such as Siberia or desert regions. The plant concept must

be able to withstand these conditions. With over 70 years of experience in handling bulk materials, Zeppelin Systems is an expert when it comes to plastics and their material properties. This means that every plant is designed accordingly and is adapted to extreme local conditions as early as the design phase: from appropriate temperature control of the conveying air and heating systems for cold regions to insulation and sun protection systems for warm areas.

Worldwide network with local partners

The high demands placed on the technologies are not only a result of the process or the environment itself, but there is also another important component for efficient production: on-site services. Already during plant installation, it is helpful to have a competent partner on site to support the start-up of the plant. In addition, the company offers holistic service for the entire plant life cycle, such as production optimization, predictive maintenance or a comprehensive training program - live on site or via virtual talk.

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About Zeppelin Systems

Zeppelin Systems is a global leader in plant engineering for the handling of high-quality bulk materials. With over 70 years of experience in process engineering and extensive knowledge in handling countless raw materials, Zeppelin Systems offers complete and reliable solutions. With 22 locations worldwide, the company supports its customers from plant design through implementation and provides all aftersales services locally, from a single source. At Zeppelin Systems, innovative processes are just as important as the clever automation solutions and full range of service they provide to cover the entire life cycle of your plant.

Each Zeppelin plant is customized to meet the requirements of each customer be it in the plastic, chemical, rubber and tire, or food industries. With the world's largest technology center network for bulk materials, Zeppelin enables its customers to carry out tests on an industrial scale and verify and optimize their plant design. Zeppelin Systems develops and manufactures its own components for key plant functions, which are also used in third-party plants. For more information, visit www.zeppelin-systems.com.

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About the Zeppelin Group

The Zeppelin Group offers solutions for the construction industry, drive systems and energy sectors as well as engineering and plant engineering; it is represented in 43 countries and regions around the world at more than 220 sites. The company's approximately 10,000 employees work together in a management holding company, six strategic business units and a strategic management center (= Zeppelin Digit): Construction Equipment Central Europe, Construction Equipment Nordics, Construction Equipment Eurasia (distribution and service of construction, mining, and agricultural machinery), Rental (rental and project solutions for construction and industry), Power Systems (drive, propulsion, traction, and energy systems), Plant Engineering (engineering and plant engineering) and Zeppelin Digit (IT and digitalization). All digital business is handled together within Zeppelin Digit. In the 2020 financial year, the Group generated sales of EUR 3.3 billion. Zeppelin GmbH is the Group holding company. It is legally domiciled in Friedrichshafen and has its head office in Garching near Munich. The Zeppelin Group is a foundation-owned company. Its roots can be traced back to the establishment of the Zeppelin Foundation by Graf Ferdinand von Zeppelin in 1908. For more information, visit zeppelin.com.

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