Through continuous improvements in the ZSE MAXX series, Germany-based Leistritz Extrusionstechnik GmbH is setting new standards for flexibility and productivity of extrusion plants in process technology. “This series has gained a foothold in the market,” explains Anton Fürst, CEO of Leistritz Extrusionstechnik GmbH. “And for good reason.” The high specific torque (up to 15.0 Nm/cm³) makes the ZSE MAXX machines some of the world’s most powerful co-rotating twin-screw extruders. Added to this is the increased screw volume (Do:Di = 1.66). The improved torque-to-volume ratio yields an increase in throughput of up to 50%. These high throughputs paired with low melt temperatures allow for optimized power supply. “Especially in times of steadily rising energy costs, we are doing everything possible in extrusion processes too, to save every kilowatt-hour we can,” explains Fürst. “Compared with our predecessor model, the ZSE HP extruder, the ZSE MAXX machine provides the same homogenization performance with a lower energy input or, rather, shows much better homogenization properties for the same energy input.” The ZSE MAXX series offers extruders with screw diameters from 18 to 180 mm. With modular screw and cylinder systems and an optimized drive module with high-quality gears and motors (with screw speeds of up to 1200 rpm, depending on the model), the machines can be used in a wide variety of applications.

Leistritz Extrusionstechnik GmbH, Germany

Pioneering plant technology

Combining state-of-the-art control technology and excellent mechanical engineering – the high-tech extrusion system from Leistritz and Azo.

Control for optimal interaction

Control of extrusion systems is a major topic of concern. It is critical for ensuring cost-efficient and optimally coordinated interaction between material...
feeders, extruders, and downstream units. The entire extrusion process can be controlled, monitored, documented, and analyzed by means of the data that are input and collected on the HMI (human machine interface) control unit. For its automation solutions, Leistritz employs proven Siemens hardware components that are individually programmed based on machine and customer requirements. “As partners in this demanding field, we can be sure that we offer good quality. With Siemens’ worldwide support network, our team can react quickly,” summarizes Fürst.

High-tech plant

Highly filled CaCO₃ plastic compounds have been experiencing a boom for a long time now. In the automotive and packaging industries, for instance, they are increasingly replacing conventional materials. The reason: They are not only cheaper but also superior in terms of their mechanical properties. “In response to this market trend, we decided to build a plant especially for this highly sensitive process with AZO – our partner for material handling – and other project partners,” explains Fürst. “With this move, we hope to show our customers exactly what is key in ensuring stable production conditions and high reproducibility.” The art of producing a highly filled compound lies in the optimal distribution of the material flows. Considerable process expertise is required to incorporate a large amount of filler as homogeneously as possible into a polymer matrix. It is especially important to control the air flow introduced with the material input. Another challenge is the material’s moisture content, which can have a detrimental effect on the process. Therefore, the processing unit and the geometry of the extruder screw used must be optimally configured for this task. Apart from the highly refined, state-of-the-art plant sections for material handling, the main component is a ZSE 75 MAXX extruder with an underwater granulator attached for granulating the melt.

Sophisticated control system

The plant is fitted with a Simatic S7 controller from Siemens. Leistritz employs the latest control system generation: An IPC 477 forms the hardware basis for easy operation and monitoring. Visualization can be performed on the integrated 15” touchscreen. Programming is based on Simatic WinCC flexible technology with the WinAC RTX soft PLC. All adjustment and control operations on the extruders and auxiliary equipment can be executed and monitored via this control unit. Formulation data can be transmitted to materials supply via an interface. During underwater granulation, for example, the starting valve is controlled. This optimizes the entire process.

Up to 20 variable-speed drives and up to 32 temperature zones for heating and cooling can be controlled and monitored with the innovative Simatic controller. The obtained process data are archived and customer- and product-specific settings (such as formulations) saved on an integrated flash memory card. Another special feature in this context is the Leistritz Chart Pilot. This software enables process data from the S7 controller to be displayed on an office-grade PC system. With this software, clear and easy analysis, filtering, and integration of measured data are possible. It supports the user in the creation of graphs for process data analysis. Another plus point: the measured data can be imported (e.g., into Excel).

This combination of advanced control technology and excellent mechanical engineering provides Leistritz’s customers with a highly flexible, state-of-the-art extrusion line.

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“With the worldwide Siemens service network, the support team can respond quickly when faults occur.”

Anton Fürst, CEO of Leistritz Extrusionstechnik GmbH