Filament winders place high demands on automation

Wound up in no Time at All

In synthetic fiber spinning plants, winders complete the spinning process. The extremely fine threads are wound from the spinning nozzle onto the oversized bobbins at a high speed. The bobbins are changed without interrupting the spinning process. In this area of application, the intelligent motion control system Simotion shows its advantages: The combination of motion control, technological functions and logics ensures high flexibility, short change-over times and user friendliness.

Spinning speeds of up to 8000 meters per minute are not unusual in modern synthetic fiber plants. They are a great challenge for the winder that follows after the Spinning process. After all, it has to remove two to twelve filament tows at this speed and wind them. To keep the spinning process from being interrupted, the full bobbins are changed on the fly.

Not only are the speeds impressive, though, but also the dimensions. Weighing up to 35 kilograms, a bobbin can take up several million meters of thread. The bobbin build-up determines the draw-off scuttle of the yarn and the possibilities for further processing it. Depending on the application, synthetic yarns have very different technological properties. This already has to be taken into account in the package build-up.

High-capacity winding technology

Today, most filament winders are core winders – that means that the tensioning spindles are directly driven. A powerful servo motor produces the superimposed traversing movement. Individual drives are used with the winding spindles and the traversing (yarn placement) to attain maximum possible flexibility in the interaction of the units and thus for the package build-up. A gauging roller measures the circumferential speed of the bobbins and reports it to the diameter calculator. The movement of a rotary table compensates for the increasing package diameter. The bobbins are changed on the fly: empty tubes are accelerated to the spinning speed, the full bobbins swing away from the gauging roller, and the threads are cut and caught by the new tubes.

A good change(-over) with Simotion D

The breakneck speeds in the production process place very high demands on the drive and automation system. It must be possible to replace defective winders very quickly during operation. This requires automatic addressing of the new winder.

With its 4-axis control, the drive-based motion control system Simotion D fulfills all the requirements of an automation solution for demanding winder systems. Simotion combines motion control as well as technological and drive functions in one hardware and software solution. It masters technological functions such as calculations for the traversing processes and the diameters of the bobbins just as easily as motion control functions – such as positioning the rotary table and run-off control. High flexibility is in demand particularly in the textile industry: in addition to fast change-over times, Simotion is distinguished by the free selection of reeling modes. To ensure high quality, all batches can be reproduced at any time using an integrated recipe memory. With its graphic programming, the system also proves itself to be extremely user-friendly.

Simotion has another advantage in store for the user: The Scout engineering system is a tool that contains everything that users need to configure the hardware, parameterize the drives, plan and program the functionality, as well as perform commissioning and testing. Extensive diagnostic tools and simple dialog guidance make the system transparent and simple to use.