The Tung Hsia company in Hangzhou, China has been manufacturing draw frames and carding machines for stable fiber spinning for 20 years. As far as the automation of controlled draw frames is concerned, the company is a pioneer in China because this is not used very widely there.

Main difficulty sliver regulation

The draw frame is one of five machines in the staple fiber spinning mill. In the spinning process, it is between the card and the ring spinning machine and consists of the elements infeed creel, draw frame and stacker. It draws and bundles the input slivers of cotton fibers or a mixture of cotton and chemical fibers. The machine bundles four to eight input slivers into one. The bundled sliver leaves the machine at four to fourteen times the speed with which the slivers are input. The main difficulty is to handle this high sliver speed at the machine output because the material thickness is measured there and has to be regulated very fast.

Uniform drive series

The speed of the Sinamics drive system is a great advantage here. To improve the material quality the company therefore chose a complete solution based on the Simotion D425 motion control system with Sinamics drives, Simatic Touch Panel and ET 200S I/O devices as well as an 1LA asynchronous motor for the main drive (with encoder) and a 1FK7 servo motor with resolver for sliver regulation.

This enabled the company to implement a regulation with superior technology within a standard solution for the HSD-961AL, DV2-AL machine. The regulated draw frame offers better quality at constant productivity than the unregulated draw frames which are still being built almost exclusively in China. Hou Zheng, the manager of the Electric Automation department at Tung Hsia was “impressed by the functionality of the system, especially in the jog and ramp up mode, in initial demonstrations of the system.” Best sliver quality is guaranteed even at top speed. Another advantage: all the parameters of the self-configuring system can be readjusted on the Simatic Touch Panel.

Successful technology transfer

The application is implemented by the APC (Application Center) for textiles in Chemnitz in cooperation with Siemens China and the customer. Great emphasis is placed on involving the Chinese engineers fully in the project. Siemens in China is therefore able to offer Tung Hsia excellent support after the project as well. As planned, Tung Hsia is well on the way to becoming the leading manufacturer of regulated draw frames in China in cooperation with Siemens.