Retrofit for a higher production capacity
Cordenka GmbH, Germany

Using a complete solution from Siemens, spinning machines for tire cord were brought up to speed to reflect the latest state-of-the-art technology.

Rayon® is a material that is obtained from cellulose and is used to reinforce high-performance tires. As a result of its advantageous characteristics, it is the preferred reinforcing material for tires that have emergency running properties.

Cordenka in Obernburg, one of the leading manufacturers of high strength textile fibers, wanted to further expand its production capacity and modernize its machines to reflect the latest state-of-the-art technology.

To retrofit its spinning machines, which up until now used products from various manufacturers, Cordenka used a complete electrical solution from Siemens.

The advantages for Cordenka
- Increased production capacity through a higher degree of flexibility and plant availability
- Simplified maintenance

Integrated solution from Siemens

The control and drive technology were designed in close cooperation with Cordenka in the Summer of 2004. The innovated machines had to fulfill four criteria: Single-motor drives, line failure buffering, simple operator control and preparation for a central machine visualization. The machine was mechanically overhauled and the drive technology modernized using single-motor drives. The objective was to increase the production capacity through a higher degree of flexibility and plant availability, improve the quality and create a basis for future technological developments in the form of single-motor drives and automated production operations.

Reliable in a tough environment

The machine spins tire cord-viscose fibers from cellulose dissolved in a sulfuric acid spinning bath and winds them for further processing. The aggressive ambient air has a high concentration of hydrogen sulfide that places high demands on the electrical equipment. Special protective measures were applied to the converters, contacts and metals to secure their reliability and to increase their resistance to corrosive gases.

Innovative technology cocktail

In the first four machines, our experts replaced the central gearbox with line shaft using a controlled MASTERDRIVES VC Compact Plus and Active Front End (AFE) infeed. The SIMATIC S7-300 control, the distributed ET200M I/O and PROFIBUS completed the retrofit.
Satisfied customer

Siemens received an order for the complete management of the electrical project - including the engineering, commissioning and building the control cabinet. Working very closely with Cordenka, a complete solution was drawn-up that was implemented by the Siemens Application Center (APC) in Erlangen. The complete modernization project, including the development and implementation of the integrated drive and automation solution, was completed on schedule.

Higher capacity, homogeneous quality

Extensive and careful planning facilitated a straightforward changeover from MASTERDRIVES VC to SINAMICS S120 Booksize drive units. The coldplate technology proved itself to be a practical supplement to the Siemens product range.

An additional advantage of the retrofit:
By using individual drives for the various functions, the number of mechanical components - which are prone to wear - was reduced, therefore increasing the plant availability and simplifying maintenance. The powerful drives increased the production capacity by more than 10%, improved the quality and increased the overall flexibility of machine.

The new drives maintain the velocity setpoints - generated using a setpoint cascade - very precisely and reliably. As a consequence, the quality of the end product is more uniform and consistent. In order to avoid material faults, the Active Line Module infeed/regenerative feedback units and kinetic buffering (KIP) buffer brief line failures. Not only this, they minimize line harmonics and EMC load for the existing low-voltage supply.

As a result of the many advantages, Cordenka is planning additional machines based on innovative drive and automation technology from Siemens.

New: Equipment with motors for single drives and operator station.
The control cabinet with converters is located centrally on a platform.

Old: Equipment with central gearbox and motor (cannot be seen) as well as power distribution and operator station.