Coated foils for packaging and technical applications are a huge growth market worldwide. The Davis Standard Converting Systems Group, with its American subsidiaries Black Clawson and Egan, as well as ER-WE-PA GmbH in Erkrath, Germany, specializes in the manufacture of machines and systems for producing multilayer foils and comparable composite materials. A wide spectrum of materials for a variety of applications are processed, including products such as technical foils over flexible packaging, box coatings, woven mesh for applications in construction above and below ground, and nonwovens (e.g., for diapers). The demand is enormous in China in particular – approximately 40 percent of ER-WE-PA’s machines are exported to this market. To meet the increased demands of its customers, the Erkrath-based company offers coordinated systems making use of co-extrusion units, the newest winder technology, and efficient automation and process control.

High speeds achieved
In order to produce high-quality foils and composite materials, the preproducts – paper, nonwovens, foils – must be unwound, and the finished products must be wound up again. High speeds are important for achieving high productivity. At the K 2010 trade fair, ER-WE-PA will introduce a new horizontal winder designed especially for the winding of high-quality composite materials. With speeds of 800 to 1,000 meters per minute, this winder is about twice as fast as previous winders. The machines are flexible and can be used with a variety of extruders and unwinding stations. They make it possible to automatically change rolls even at the highest speeds and allow the tracks to be automatically connected in order to maintain uniform roll weights in the finished product. The very high speeds place great demands on the control and regulating technology, however. These demands include the need to maintain the traction forces in the tracks at tight tolerances and to adjust them to the respective materials for all processes. This can only be achieved with mature, high-quality, and carefully coordinated drive, control, and regulating technology.
Winding performance with motion control
That is why ER-WE-PA decided to use the Simotion motion control system for the first time. The drive-based Simotion D4x5 enables individual control of each drive position, thus ensuring the highest possible consistency and quality of the process. This allows sensitive or complex materials that tend to vibrate and wrinkle to be precisely wound at high speed. With the Converting Toolbox for Simotion, Siemens offers a software program that contains an extensive repertoire of standard functions for winders and saves a great amount of engineering effort. This makes it possible to automatically change the reels at full speed. ER-WE-PA uses the openness of the software to make individual adjustments. For the winders, Sinamics frequency converters are used, which are coupled with Simotion using Drive-CLiQ. Thanks to the innovative system bus, the parameters of the drive components do not need to be set by hand in a cumbersome manner. Defective parts can thus be replaced quickly.

Safety standards play a major role in winding applications. For the new horizontal winders, the logic and safety tasks are controlled by a fail-safe Simatic S7-317F, which is connected with the other parts of the system using Profsafe. For fast and easy setting of the parameters and convenient process monitoring, the 15-inch Multi Panel MP377 with Simatic WinCC flexible is available to the operators.

Consistent melt quality
The heart of every foil processing line is the extruder. Due to the high standards to which the end products are held, the processing of new plastics is becoming more important. Flexibility in production is thus the most important factor for every manufacturer that wants to assert itself in the market. ER-WE-PA is optimally prepared in this regard: with coordinated screw designs and nozzles that were internally developed and produced based on experience gained in several decades of extruder technology, the company is achieving optimal coating quality for a wide variety of polymers. ER-WE-PA relies on tried and tested automation technology. The Sinamics modular drive system features easy networkability. In order to introduce the drive energy into the screw in a precisely controlled manner, compact and efficient 1PL6 asynchronous servomotors are used. A Simatic S7-400 high-end controller takes care of the higher-level machine control and precise temperature regulation.

A coordinated system
ER-WE-PA is completely satisfied with the end-to-end automation solution for its extruders and winders. “Siemens provides us with drives, controllers, programming stations, and operator stations from one source,” says Andreas Kandt, CEO of ER-WE-PA. “All components are coordinated with each other and work together in an optimal manner. Service and spare parts are also available worldwide within a short period of time because Siemens now has a presence on all continents. This is a decisive criterion for an internationally positioned company such as ours, with a high percentage of exports to Asia.”

For high-tech materials:
the co-extrusion units from ER-WE-PA