



Interview with Erwin A. Fertig: The packaging industry is characterized by customized machine designs

Motor design with packaging in mind

With a global market share of 22 percent, Germany is (according to German Engineering Association VDMA) the world leader in packaging machine engineering, followed by Italy with 16 percent, the United States with 12 percent, Japan with 10 percent, and China with 6 percent. Because the market is split into food, pharmaceuticals, chemicals, cosmetics and non-food segments, the packaging industry is highly diverse. Accordingly, it is dominated by medium-sized, specialty machine builders which are frequently owner-operated, who custom-design most of their products for the respective goods being packaged or the application. The market's size and wide spectrum of requirements also make it quite attractive for suppliers of automation technology.

Automation for packaging technology

The importance of electrical automation technology in packaging machine engineering became apparent quite early. In the early 1990s, while I was still the owner of Elau AG, machine designs began to move from mechanical drive solutions (upright shafts) to electrical drive technology. The trend towards combining PLCs with motion control units, or different programming platforms, also started at this time. These approaches can be optimally implemented today using PC-based control solutions from Beckhoff.

There is still plenty of room for growth for suppliers of modern drive and control technologies. The global packaging market keeps growing at an annual rate of 5 percent, with significant increases expected due to the integration of actuators and sensors in the field.

Motor development with built-in packaging know-how

Fertig Motors GmbH was founded in March 2010 as a joint venture with the Beckhoff Group. Our goal was – and still is – to develop the latest generation of innovative servo motors that feature exceptional dynamics, energy efficiency and cost-effectiveness, and to design them especially for PC- and EtherCAT-based control technologies from Beckhoff. Needless to say, the vast experience we gained in the demanding packaging industry contributed a great deal to the features now included in these new motors.

When you develop servo motors for packaging machines, it is particularly important to deliver the right ratio of inertia and peak torque. Since the mostly non-continuous movements in packaging processes are frequently characterized by rapid acceleration and rapid braking, we paid special attention to these requirements when we developed the Beckhoff AM8000 series servo motors. These advanced motors feature One Cable Technology (OCT), which

combines the feedback and power systems into one cable. Most packaging machines are run in two-shift or three-shift environments, which is why we also built these Beckhoff motors with extra-strong motor shafts and bearings. Also, with the typically very large number of servo motors in a packaging machine, giving them plug-and-play capability reduces commissioning time and costs. For us, "plug-and-play" means giving the motor an electronic name plate so that the drive controller receives all motor data automatically.

In addition to the standard AM8000 series, we introduced the AM8800 stainless steel servo motor series. It meets EHEDG requirements and is used predominantly in the pharmaceutical and beverage industries to facilitate high pressure wash cleaning procedures and prevent the build-up of bacteria.

Industry 4.0: Communication from the drive to the web

The packaging machine industry, which must continuously adapt to changing package designs and shapes, is an ideal proving ground for Industry 4.0 concepts. Accordingly, the packaging machine of the future must meet a demanding set of requirements. It must be intelligent, quickly adaptable, and efficient. The production processes should even be controllable by the products themselves and for this purpose provide web connectivity. This requires machines to have actuators and sensors that are fully automated and able to communicate with one another. Accordingly, many primitive motors and actuators that currently don't have these capabilities will have to be replaced with modules that can be integrated into the automation network. With PC-based control and EtherCAT, and the matching drive technologies, Beckhoff already offers fully vertical and horizontal integration capabilities today, thus providing the ideal platform for Industry 4.0 concepts in the packaging industry.

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