

"@ttract"-ive egg boxes from Huhtamaki



→ Packaging machines are sometimes so custom to the application that the packaging manufacturer prefers to build them in-house. With these conditions in mind, Huhtamaki, whose head office is in Finland, is not only one of the largest manufacturers of packaging in the world, they also build the matching machines. Huhtamaki uses Beckhoff Industrial PCs and EtherCAT as the control platform in the machine for manufacturing colored egg boxes. On account of the positive experience, Beckhoff controllers have been declared the in-house standard.

PC Control and EtherCAT for premium packaging

The core business of Huhtamaki Molded Fiber Technology in Franeker, in the Dutch province of Friesland, involves the production of egg boxes made from pressed paper. The current packaging hits are the futuristically designed and colored @ttract! egg boxes, for which Huhtamaki also builds the necessary production machines.

In order to manufacture the egg boxes, wet paper fibers are pressed into a specific mold – hence the name 'molded fiber'. The paper pulp is initially layered in a mold that has small air holes on the inner sides. The paper is drawn into the mold by means of vacuum and a press is subsequently applied. After that, the product is dried, briefly moistened again and pressed a second time. Jelle Post, Technology & Development Manager of the Engineering Department at Huhtamaki, explains: "The egg box gets its smooth surface from this wet treatment.

Besides the luminous colors, the stylish features that distinguish the new @ttract! series from the conventional grey egg packaging are the rounded edges and the 3-D labeling technology, which allows the box to be printed on all sides."

Machine construction niche

In constructing this special machine for the production of @ttract! egg boxes, Huhtamaki is occupying a niche position that is becoming typical in the packaging market. The company has founded its own machine construction company under the name Huhtamaki Molded Fiber Technology (HMFT) BV, which supplies Leotech machines and process technologies. "Here in Franeker, we are continually developing new techniques for Huhtamaki's worldwide molded fiber business," says Post, "to best enable the manufacturing of new packaging products."



The ultra fast EtherCAT fieldbus makes the desired specifications possible.

For the production of the new @ttract! egg carton series, Huhtamaki has built, among other items, a new press based on Beckhoff servo technology and Industrial PCs.

Kremer Industriële Automatisering BV from 's-Heerenberg has been a Beckhoff system integrator right from the start. The company not only has outstanding knowledge of production processes and controllers, but also understands how to combine them with the Beckhoff PC-based control concept. Kremer works for Huhtamaki as a technology partner, supporting the development of new machines and the modernization of existing ones.



Technical innovation makes new design possible

"On account of the speed, precision and flexibility required for the production machines in the @ttract! series, we could no longer work with traditional PLCs and therefore decided to switch to Servo Drives and Industrial PCs," explains Post. "Since we do not employ any control specialists ourselves, we set off in search of a partner who could take care of the control technology part. Our choice fell on Kremer Industriële Automatisering BV and Beckhoff," says the engineering expert.

The servo technology now enables faster and more precise control and, in addition, simpler construction of the presses, where the main concern is to ensure that the spindles, which are electronically linked to one another, are driven synchronously. "Using the Servo Drives and the Beckhoff Industrial PC, we can now guarantee synchronous running of the spindles with a maximum deviation of the motor axis of 1.8°, irrespective of the load. Previously, with regard to precision, we consciously went to the limit, so we have switched from Lightbus and SERCOS to EtherCAT for the fieldbus communication," says Post, summarizing the advantages of the new controller.

Another important component of the production line is the labeling unit, which represents a new development. The label is affixed to the strongly-arched box using a special adhesive. Labeling takes place at very high speed. Beckhoff provides a premium service here too: a minute shift of 0.5 mm can be controlled in just 1 ms.

Advantages of the Industrial PC

The use of Industrial PCs offers great flexibility and makes modular expansion of the controller possible. Jelle Post adds: "Besides that, the Industrial PC is integrated in the factory network. All relevant data is saved in an SQL database via Ethernet. A VPN connection can be established for maintenance work so that we can carry out remote servicing."

On account of the positive experiences in the past few years, Huhtamaki has made the Beckhoff control system the standard for their various machine types. The C6140 control cabinet PC from Beckhoff is used for the larger machines (presses and the all-side labeling unit). Various fieldbuses are used for the connection between the Industrial PC and the Servo Drives, including Lightbus, SERCOS and CANopen. EtherCAT is used in the newest machines. Smaller machines, such as printer lines and denesters are controlled by the DIN rail-mounted CX1020 Embedded PC running Windows CE. These systems are visualized by means of a .NET application.

- > Huhtamaki Molded Fiber Technology B.V. www.huhtamaki.nl
- > Kremer Industriële Automatisering BV www.kremer.nl
- > Industrial Automation Link www.ial.nl