


Conveying and blending systems for plastic film production

PC-based Control increases performance and optimizes system communication

The plastic manufacturing industry can count the food, medical and electronics markets as major growth areas for flexible packaging. The American company Advanced Blending Solutions is a supplier to the plastics industry of auxiliary equipment for material handling, blending and controls. Focusing on the plastic film and fiber markets, ABS equipment supports higher end applications such as in food and medical packaging as well as fiber and resin compounding. Based on PC- and EtherCAT-based control technology from Beckhoff, ABS offers its customers flexible solutions that are robust, cost-effective and innovative.



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The continuous blender developed by ABS performs simultaneous metering of all components, which eliminates the need for mechanical mixing, while consistently producing the desired blend.

Advanced Blending Solutions (ABS) offers scalable blending technologies ranging from simple to highly complex systems. "Finding the optimum recipe is crucial for product quality and throughput," said James Wood, Director of Engineering at ABS. PC-based Controls from Beckhoff handle this important function in ABS blenders.

Inside the 99,000 sq. ft (appx. 10,000 sq. m) production facility in Menominee, Michigan, plastic blenders, vacuum receivers, pump packages and weigh hoppers are just a few of the advanced machines manufactured on-site. The blenders perform simultaneous metering of all raw material components, in the form of granules, which eliminates the need for mechanical mixing, while consistently producing the desired blend.

"We are committed to being a single source provider for our customers' industrial blending/extrusion needs, starting from system design to on-site installation," said James Wood. "Our machinery handles and stores the raw material upon first arrival to the customer's facility and then conveys the resins to ABS blending equipment. Our equipment functions in one of two modes: either as the master controller on the machine line, overseeing all aspects of the process or as a slave device, integrated to and communicating through another vendor's downstream plastic processing equipment," said James Wood.

PC-based Control as integrated control platform

During an ambitious campaign to all at once overhaul design, boost controller performance and improve system communication, ABS decided to offer their Simplicity Series Blenders with Industrial PC (IPC) technology from Beckhoff in 2007. Today, the PC- and EtherCAT-based control platform has essentially become the norm for ABS. "Utilizing Beckhoff technology gave us the ability to more easily manage our equipment by standardizing on a uniform control platform consisting of Beckhoff Panel PCs, TwinCAT PLC software and EtherCAT I/O," explained Wood.

ABS uses the 15-inch Beckhoff CP6202 built-in Panel PC with touch screen as standard. "The multi-core processor technology offered by the CP6202 gives us plenty of performance. With Compact Flash as the storage media it's an exceptionally stable piece of hardware which is of critical importance in the harsh environments typical of plastics applications," said Wood.

"With the integrated TwinCAT PLC and Motion Control software, we took a major step forward with regard to performance, engineering and the organization of our applications in software libraries," said Wood. "TwinCAT offers excellent control support for our blenders, extruders and material handling systems."

EtherCAT controls the air flow velocity that's moving the material through the vacuum pump and feeding machines that perform simultaneous metering of all components. Using the EL6751 CANopen master terminal, ABS is able to integrate CANopen devices from other manufacturers in its customer-specific machines. The data from all connected CANopen devices are transmitted over one standard Ethernet cable and one EtherCAT network. "EtherCAT is the standard network for our Beckhoff control solution, with approximately 99 % of our Beckhoff controls and I/O devices having EtherCAT connections," said Wood.

Shorter engineering time – lower costs

"TwinCAT has enabled us to simplify the entire programming process, which is extremely beneficial for our product development cycles," said Wood. "Using the Beckhoff PC-based Control solution has saved us between 20 % and 30 % on control hardware costs, compared with our previous solution." In addition, the new control system is more energy efficient: "We've achieved significant energy savings in the material conveying process through better velocity control of the pumps," said Wood.

Future plans are well underway at Advanced Blending Solutions: "With the powdered form of plastics growing in popularity as the raw material for blending and extrusion, we are working on a line of automated feeders that will convey and blend powders. Based on our previous successes, we will use PC-based Control from Beckhoff," said Wood.

Further Information:

www.adv-blend.com

www.beckhoffautomation.com