

Entivity Process Control Success Story #607



Customer Profile

Headquartered in Troy, Michigan and part of the ThyssenKrupp Automotive group, The Budd Company is a global source for vehicle design, engineering, manufacturing and technical services.

Application

- Process Control

Industry

- Automotive

Location and Web Site

- Troy, MI
- www.buddcompany.com

Key Benefits

- Saved \$75k by programming in-house with flowchart control
- Reduced scrap by 75% through product quality improvements
- Flowcharts eliminated need for 3rd-party programming and protects proprietary technology
- Simple PID programming interface made loop configuration easy
- Existing drawings (such as Autocad™ and Visio®) dropped into HMI screen design

Mission Critical Capability

- As a research site, ease of program modification and in-house development were most important



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Automotive OEM Doubles Line Speed and Saves Money with Entivity

The Budd Technical Center is a corporate R&D facility, supporting automotive operations through understanding and applying advanced technology in the areas of product design and testing, process monitoring and optimization, and material application. The R&D center uses Think & Do Live! from Entivity to control a molding compound machine.

At another site, The Budd Company produces pre-mixed compounds for use at their other facilities. According to Bruce Greve, Manager of Advanced Development, "Our existing molding compound semi-automatic systems have evolved over the years into a network of automation systems. After a detailed review of our existing systems, we determined that we needed higher quality and greater production rates. We designed a new continuous mixing process using Live! software. Our Plastics Development Group had two basic goals for the project:

- Double the line speed in manufacturing molding compounds
- Improve the quality of the compound so scrap is reduced by 75%

The machine is complete and we are now performing evaluation testing for manufacturing."

In-house Programming Saves Money and Protects Research

Initially, an outside system integrator was asked to quote a traditional control system for the



Plastic carrier sheet unwinds to bring raw materials into molding compound process

R&D Molding Compound Project. Greve explains, "The system integrator's quote for this project was 33% of our total budget for the machine. In addition to the high-cost quote, we would've had to pay for change orders for any R&D modifications. To summarize the evaluation, we saved approximately \$75k when we chose to do the project with Live!." The surprising insight that Greve shared was that the \$75k savings was not the real decision clincher. The more critical issue was protecting intellectual property. Greve continues, "Our business is very competitive and if we went outside the company for a control system, there is always the danger of proprietary information leaking to outsiders. After seeing a demo of Live! we felt that we could do the system in house."

System Overview

The molding compound machine is presently a half-scale model that measures 10'h x 100'w x 3'd. Once the proof-of-concept is complete, the research center will release the design to the production division for use in full-scale manufacturing.

Customer Satisfaction

“Live! software and PC-control are not just for plant use. It was very useful for our R&D needs and worked quite well. I am pleased that the product is as easy to use as they say.”

*Bruce Greve
Manager of Advanced Development
The Budd Company*

According to Greve, “We knew we needed to precisely control critical functions such as material metering and blending processes. Knowing that we are doing process research, a flexible, open, easy-to-work-with programming environment was important to the project.”

The basic continuous process starts with three raw materials being pumped at the right process speed through the in-line mixing. The in-line mixing temperature and pressure are controlled to combine raw materials into a homogeneous paste of polymers and fillers. This paste is spread uniformly on a plastic carrier sheet. The sheet is wound into a large roll at the end of the machine. Once the roll reaches a certain size it is cut then shipped to another location such as a molding plant. There, the compound sheet is unrolled, cut by weight, and fed into a compression molding machine, which makes interior and exterior body panels.

The molding control system consists of about 40 I/O points. 80% of those are analog and the rest are discrete. Greve goes on to explain the process control, “The Live! application consists of 10 flowcharts and 12 HMI screens.

The operator uses a main screen to input a basic formula (recipe) and line speed data, then pushes one button to start. The control system then pumps the three materials at the right process speed. In-line mixing combines them into a homogeneous substance, while sensors collect temperature and pressure measurements. The plastic carrier sheet moves at the selected line speed with ready-to-go material. This continuous process has 4 PID loops to control carrier tension, temperature, and pressures.”

Transferring Research to Manufacturing

According to Greve, “With our prototype molding compound process, we effectively doubled line speed and significantly reduced scrap with improved higher-quality molding compound. We are working with the Plastics Division to fine-tune the system. The control system design and program are complete and the mechanical design is about 85% complete. So far, the plant folks are impressed and interested in our solution. Budd’s manufacturing plants typically standardize on particular control systems, but when a better solution exists they are flexible.”

Debugging the Prototype

“Live!’s debugging tools were the key part to getting the whole system working,” explains Greve. “We were able to isolate I/O points and see that the system was up and running.”

Live! provides extensive debugging capability with AppTracker, a multi-paned tool that gives the programmer a clear picture of the whole project. It indicates active flowcharts and active data values.



Feed bins for molding compound raw materials at process start



Molding compound sheet exits process and on to take-up reel

EasyTrac shows flowchart execution paths with effective use of color, so one is quickly able to understand the I/O and control logic status of the manufacturing process using just the software.

Live! as a Research Tool

In Greve’s final comments he emphasized, “Live! software and PC-control are not just for plant use. It was very useful for our R&D needs and worked quite well. I am pleased that the product is as easy to use as they say.”

For more information on how Entivity can help solve your application, visit our website at www.entivity.com, or call (800) 722-6875.