Epicor® Mattec MES drives continuous improvement

Company Facts

▶ Location: Florence, Kentucky, United States
▶ Industry: Manufacturer of plastic battery cases for automotive OEMs and aftermarket
▶ Web site: www.johnsoncontrols.com

Success Highlights

Challenges
▶ Manufacturing environment – 44 injection molding machines
▶ Statistical Process Control (SPC) and Statistical Quality Control (SQC)
▶ Reduce scrap
▶ Increase machine utilization
▶ Goal of doubling production efficiency (38-second vision)

Solution
▶ Epicor Mattec MES, a manufacturing execution and real-time production monitoring system

Benefits
▶ Decreased scrap to 1.37% (reduced start-up scrap by 23% and running scrap by 27% in last 7 years)
▶ Decreased machine downtime by 3.1%
▶ 13% improvement in conversion cost (cost to make each unit)
▶ 8% increase in overall productivity
▶ 50% reduction in changeover time
▶ Annual cost of quality reduced by $600,000

Johnson Controls

"We were the Flintstones. Now we're the Jetsons." That's the metaphor Dave Rose, Quality Engineer at Johnson Controls, uses to illustrate the difference Epicor Mattec MES has made in his plant's production, process and quality monitoring capabilities.

Rose is talking specifically about how the process of setting control limits for fill times and cycle times on his plant's 44 injection molding machines has evolved since Mattec MES' implementation.

"In the old days we couldn't do true Statistical Process Control (SPC), because we need material, pressure, heat and mold temperature data from 300 cycles before we can set up the control limits. It's impossible to do that manually with the amount of equipment we have," he says. "All we do now is query Mattec MES after 300 cycles and it sets the control limit. I monitor the real-time screen from my desk or at home and I can see how each machine is performing against those control measures."

Prior to Mattec MES, Rose's group would collect data only once per shift, requiring three to four shifts before he could perform statistical analyses on the processes.

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"Now, I take a snapshot of every cycle to see if the process is in control. Mattec MES is just an awesome tool."

From a quality standpoint, Rose analyzes key part dimensions, such as weight, setting up target values in Mattec MES. Each shift then does a part check against those targets. Significant deviations could point to a problem with the mold or lead to machine shut-down.

"I haven't gotten to true Statistical Quality Control (SQC) yet. Our parts don't vary by much, and we've got four people measuring dimensions, so there's some natural variation. We're looking at getting a coordinate measuring machine, which will interface with Mattec MES, allowing us to do SQC."

Mattec MES' reach extends throughout the organization

Mattec MES is deeply integrated into nearly every aspect of the plant's daily operation, monitoring machines and production processes, as well as synchronizing and monitoring robot-controlled packing, labeling and transfer processes within the facility.

Rose hosts a morning meeting with representatives from eight different operational disciplines, where he reviews scrap reports from the previous day and previous shift to see if known issues have been resolved, and if not, assign resources to take further action. The result, by Rose's measure, is a scrap rate on the threshold of world-class.

"We used to run 3% to 4% scrap. Last month we were down to 1.37%. You can't get much better than that; that's world-class and is largely attributable to Mattec MES. It's the tool that gives us the numbers we need to make good decisions."

Kenzie Beard, Johnson Controls' IT/IS Technical Service Specialist, agrees. "Mattec MES gives you the black and white; good or bad. It provides snapshots of machine settings, and when you graph those snapshots out you can identify problems early and go straight to the problem rather than using the old-school trial and error. It lets us be proactive and fix a problem before we make a bad part."

Productivity up, costs down

According to Beard, this ability to identify trends early has allowed Johnson Controls to institute more effective preventative maintenance procedures, decrease machine downtime by 3.1%, increase productivity by 8%, and decrease the cost to produce

each unit by 13%. Particularly in challenging economic times, such continual improvement is critical to remaining viable in the automotive industry.

"We can't just run product, have dead money sitting in our warehouse and wait for our ROI. Mattec MES has helped us automate, downsize and get lean, not just in production, but throughout the organization."

Beard estimates that Mattec MES is monitoring between 250-300 machines and processes at Johnson Controls, from the injection molding machines to final product bagging.

The company's most important productivity initiative at present is what Beard terms the "38-Second Vision". Johnson Controls has recently moved from using single-cavity to double-cavity molds. Historically, using the single cavity molds the company could move one part every 38 seconds through every work station in the production and handling process. Their vision is to produce two parts in the same 38 seconds. Using Mattec MES to monitor all equipment involved in part production, picking, hot stamping, handling and pressure testing, Beard says they've reduced the time to run double the parts from 54 seconds to 47.5 seconds—less than 9 seconds from their goal.

Transforming cost into profit

At the same time, the company's annual cost-of-quality, the cost of ensuring a quality part, which includes raw materials, labor, customer credits issued for bad product, has decreased by over $600,000 annually. That cost is typically figured into the price charged to the customer.

As counter-intuitive as it seems, cost-of-quality has actually become a profit center for Johnson Controls, thanks in part to Mattec MES. "Part of the cost is raw material, plastic, but the system helped us determine that we could make a quality part containing a certain amount of reclaim material, material from recycled scrap," says Beard. "So with the money we save on raw materials we justified purchasing a grinder to grind scrap, and because we have excess capacity on the grinder we contract with other companies to grind their bad parts. We're using that material and putting it back in the system."

Whether speaking of specific initiatives like this, or of company-wide continuous improvement, Beard believes Johnson Controls' success lies in individuals and ideas, using tools like Mattec MES to inform their decisions. "Mattec MES is the crutch we lean on whenever we need to decide what we want to do."

About Epicor

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Contact us for more information on Epicor Products and Services

📞 +1.888.544.6315   ✉ info@epicor.com   🌐 www.epicor.com

Corporate Office	**Latin America and Caribbean**	**Europe, Middle East and Africa**	**Asia**	**Australia and New Zealand**
804 Las Cimas Parkway	Blvd. Antonio L. Rodriguez #1882 Int. 104	No. 1 The Arena	238A Thomson Road #23-06	Suite 2 Level 8,
Austin, TX 78746	Plaza Central, Col. Santa Maria	Downshire Way	Novena Square Tower A	100 Pacific Highway
USA	Monterrey, Nuevo Leon, CP 64650	Bracknell, Berkshire RG12 1PU	Singapore 307684	North Sydney, NSW 2060
Toll Free: +1.888.448.2636	Mexico	United Kingdom	Singapore	Australia
Direct: +1.512.328.2300	Phone: +52.81.1551.7100	Phone: +44.1344.468468	Phone: +65.6333.8121	Phone: +61.2.9927.6200
Fax: +1.512.278.5590	Fax: +52.81.1551.7117	Fax: +44.1344.468010	Fax: +65.6333.8131	Fax: +61.2.9927.6298