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TRANSPARENCY: A NEW AGE IN METALFORMING

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Tuesday, March 1, 2016

In this age of automated shopfloor-data collection and delivery, there's no reason for metalforming-plant managers to not know exactly what's going on at their production lines—anytime, anywhere. The ability to collect real-time statistics from equipment allows metalformers to leverage modernized information-technology systems as the foundation of a data-quality program. Then, they can use the collected data to help govern the dozens of critical decisions made by shop managers, day in and day out, to ensure the optimization of overall equipment effectiveness (OEE).



Data quality has become the primary concern at Wiegel Tool Works. Using Wintriss' ShopFloorConnect software to oversee its press lines and gather and deliver production and downtime data, the firm has decreased changeover times by 20 percent and increased OEE by 10 percent.

The end goal, as always, is to meet or exceed quality and delivery expectations of customers and—most importantly—optimize efficiency and profitability. Think “garbage in, garbage out,” as the phrase relates to computer programming, and apply the theories to building a quality metalforming operation.

A Modern-Day Metalformer's Data-Quality Program

Case in point: The data-quality program in place at precision metal stamper and tool-and-die shop Wiegel Tool Works (WTW), in Wood Dale, IL. WTW has been collecting and reacting to shopfloor data for some 12 years, via the evolving technology offerings from Wintriss. Wiegel has for years used Wintriss' PacNet reporting software, SmartPac 2 press controls, LETS enhanced data-collection software and, most recently, ShopFloorConnect asset-utilization software. By collecting and analyzing shopfloor data and reacting to issues impacting efficiency, the plant couldn't help but

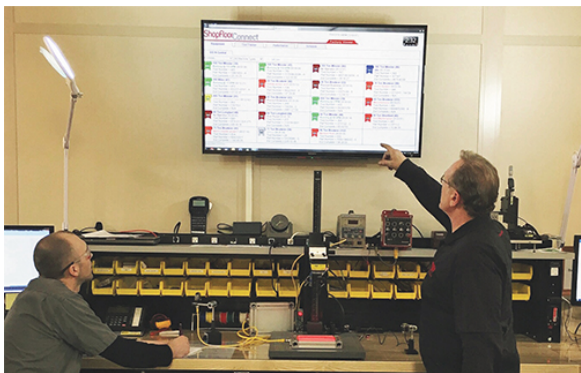
realize positive results.

To take the next steps, two years ago WTW owner Aaron Wiegel embarked on the company's most recent campaign to ensure that the data being collected and used to drive management decisions is as accurate and complete as possible.

“While we experienced considerable efficiency gains in areas like quick die change and OEE,” says Wiegel, commenting on 12 years' worth of shop-floor data collection, “we still believed we could accomplish much more by getting better data from the floor. Too much downtime was being marked generically as ‘unplanned’ without the detail that we, as managers, needed to make the improvements necessary to realize our full potential.”

Reaching that potential is a focal point for Wiegel and his team, because, as he notes, “all of the brick and mortar (including modern metalforming technology) we need is here. Our floor space has been ‘leaned out’ to maximize OEE.”

Done Adding Brick and Mortar; Time to Tackle Inefficiencies



In addition to attacking press-line OEE and changeover times, WTW vision and sensor specialists use ShopFloorConnect to track the performance of individual tools. Toolroom personnel can use the software to track the number of hits between maintenance cycles and compare the data to a standard developed for each tool to not only ensure that it's getting the predicted life from each tool but also to help prompt maintenance scheduling.

ShopFloorConnect. This allows us, as managers, to address the critical issues impacting efficiency. Now, management and the pressroom work in unison to closely track our nonvalue-added time, and team up to eliminate it at every turn."

ShopFloorConnect collects data from any equipment on the shop floor—not just presses—via wired or wireless Ethernet communication to display real-time machine status on a web browser. It can detect when a machine is running, count machine cycles and part production, and, in the event of a stoppage, it can even prevent a machine from restarting until the operator has entered a code specifying a downtime reason.



100 Ton Minster (39) Running @ 39 RPM (00:06:07) Tool Number = 776 Part Number = N/A Est Complete = 18:14:00	100 Ton Minster (41) Running @ 39 RPM (00:18:40) Tool Number = 697 Part Number = N/A Est Complete = 20:01:40	100 Ton Minster (81) Tool Maintenance (01:58:02) Tool Number = 688 Part Number = N/A Est Complete = 125:09:43	100 Ton Minster (99) Tool Travel (00:21:39) Tool Number = 926 Part Number = N/A Est Complete = N/A
200 Blix (47) Changeover Offline (18:54:36) Tool Number = 754 Part Number = N/A Est Complete = 00:11:00	30 Ton Bruderer (42) No Operator (02:30:44) Tool Number = 775 Part Number = N/A Est Complete = N/A	30 Ton Bruderer (32) Machine Prob (00:20:31) Tool Number = 743 Part Number = N/A Est Complete = N/A	30 Ton Bruderer (99) MIR (00:28:36) Tool Number = 264 Part Number = N/A Est Complete = 02:36:54
400 Ton Minster (51) Stop (02:54:12) Tool Number = 555 Part Number = N/A Est Complete = N/A	40 Ton Bruderer (43) Plastic Downline (44:58:41) Tool Number = 151 Part Number = N/A Est Complete = 00:00:00	400 Ton Minster (75) Running @ 42 RPM (00:00:01) Tool Number = 558 Part Number = N/A Est Complete = N/A	60 Ton Bruderer (111) Running @ 160 RPM (00:28:16) Tool Number = 450 Part Number = N/A Est Complete = 05:46:38
60 Ton Longlead (48) Cot Change (00:22:21) Tool Number = 581 Part Number = N/A Est Complete = 2:11:01:40	60 Ton Longlead (84) Tool Maintenance (00:01:29) Tool Number = 823 Part Number = N/A Est Complete = 2:39:56:40	60 Ton Minster (44) Running @ 100 RPM (00:02:45) Tool Number = 369 Part Number = N/A Est Complete = 1649:38:42	60 Ton Bruderer (49) Est Maintenance (00:00:37) Tool Number = 650 Part Number = N/A Est Complete = 192:56:45
70 Ton Bruderer (45) Running @ 38 RPM (00:08:02) Tool Number = 626 Part Number = N/A Est Complete = 11:52:01	70 Ton Bruderer (54) No Operator (01:11:20) Tool Number = 12 Part Number = N/A Est Complete = 12:52:57	90 Ton Bruderer (112) Running @ 100 RPM (00:00:07) Tool Number = 792 Part Number = N/A Est Complete = 6:11:20	

Plant-wide, everyone now knows how the company is doing in regard to OEE and changeover times. Wiegel's managers including president Aaron Wiegel, shown here leading a meeting on OEE, send out daily, weekly and monthly updates that track metrics for every press and tool. Knowing that the data are available, reviewed and shared drives home the notion that management requires plant-floor ownership of process improvement, and personal responsibility for the company's efficiency.

Improved Visibility Brings Plenty of Surprises

Wiegel notes that his team was surprised at some of the issues that became low-hanging fruit when it came to completely grasping the various causes of unscheduled press downtime. While he expected to find that maintenance-related issues were leading to downtime—slug marks, for example—instead it was more of the procedural things that had press operators struggling. Among them, according to the new downtime codes his team put into place with ShopFloorConnect: timely staging of coils, tooling and packaging equipment and additional labor. A good lesson in 5S strategy and implementation, he says, was just what the doctor ordered in order to drive down inefficiencies.

"We also attacked our die changes—not only setup of new tools but also the process used to remove dies from our presses," says Wiegel. "We found that we were using 130 different tools out on the shop floor, which really complicated our processes and led to inefficiencies. We have since reduced that to 35 standard tools. We also added shadow boards at every press and color-coded the tools to ensure that they remain at their assigned press.

"We also enhanced our kanban system for packaging," Wiegel continues, "to address another downtime issue identified by ShopFloorConnect. This ensures that we keep the proper min-max levels of boxes, skids and interleaf paper at each press, so that our operators don't have to leave the press and head out into the warehouse in search of packaging materials."

WTW provides primarily stamped copper for the automotive-electrical industry—terminals, lead frames and bus bars. It employs 130 people working in two buildings totaling 93,000 sq. ft. Recent additions to the plant floor include a 180-ton Minster mechanical press acquired in 2012, says Wiegel; and a 90-ton high-speed Bruderer mechanical press added in 2014. As the new presses quickly filled with work, Wiegel turned his attention to getting the most out of the equipment he has.

"When we decided to invest in ShopFloorConnect," he says, "we had OEE on our mind. But, we really turned our focus to OEE once we got the software installed and up and running. That was closer to mid-2015 when we took a closer look at how operators were using the software's downtime codes. We implemented programs to stress and reinforce to operators the importance of improving the accuracy of the data flowing through

For Wiegel, the main concern was the reasons being cited for downtime. "We had to stress to operators the need for accurate data," he says. "When we first implemented ShopFloorConnect, right from the start we learned a lot about what was really going on at the presses, and we have been able to address numerous issues. As a result, we've decreased changeover times by 20 percent and increased OEE by 10 percent."

It's important to note the difference in how ShopFloorConnect calculates OEE as compared to the traditional approach. That difference revolves around defining the performance of the machine when it's running, i.e. the number of parts produced over the measurement period compared to the machine ideal rate (MIR)—the theoretical maximum number of parts produced at the highest possible speed. A traditional OEE calculation does not account for part complexity, instead using the same MIR for every job that runs. ShopFloorConnect allows a metalformer to apply a specific MIR for each job segment or machine combination in the process.

Wiegel is Watching, Via Waterfall Alerts

Plant-wide, everyone now knows how the company is doing in regard to OEE and changeover times. Wiegel's managers send out daily, weekly and monthly updates that track OEE and changeover times for every press and tool. Reports track tasks that make up the complete changeover process, from last part off to first part off, including die removal, die setup, setup of scrap bins, coil feeds, conveyors and related equipment, and first-piece inspection and approval. Knowing that the data are available and shared, Wiegel says, drives home the notion that management requires plant-floor ownership of process improvement, and personal responsibility for the company's efficiency.

Add to that the fact that employees now know that Wiegel is watching closely. He set up a waterfall alert system that, as the saying goes, has the buck stopping at his desk. For every production and changeover task, the company has assigned a reasonable time window for it to be accomplished.

If, for example, an operator indicates in ShopFloorConnect that his press is down because he is waiting for coil stock, an e-mail goes out to all of the material handlers identifying them of the need. After 5 min. ("I expect material to arrive at the press within 5 min. of the call," Wiegel says), an e-mail goes out to alert the production manager. A 10-min. delay triggers an e-mail alert to the plant manager. And, after 20 min. Wiegel receives an e-mail alert, which sends him out to the shop floor.

Tracking Tool Performance, Too

In addition to attacking OEE and changeover times, WTW also uses ShopFloorConnect to track the performance of individual tools. It tracks the number of hits between maintenance cycles and compares the data to a standard developed for each tool, to not only ensure that it's getting the predicted life from each tool but also to help prompt maintenance scheduling.

"When new tools enter production," says Wiegel, "we can go into ShopFloorConnect and set the limits based on how we predict they'll perform. Then, once the tool has run for a while, we can adjust those expectations accordingly."

Managers also have access to quick color-coded status reports for each tool—the tool status turns yellow on the display when it's approaching its hit limit and red when the tool needs to be pulled for maintenance. "Or, a red indicator might just warn our production people to pay extra-close attention to the performance of that tool," says Wiegel. **MF**

See also: [Wintriss Controls Group LLC](#), [ShopFloorConnect by Wintriss](#)

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