



Frontal view of the new 14-cubic-foot drum-blast system



Side view of the new system

Western Forge Upgrades Shotblasting Operations

Western Forge Corporation of Colorado Springs, Colo., is a producer of quality hand tools. They recently upgraded their blast-cleaning operations by investing in new equipment from Blast Cleaning Technologies, a move that has increased the efficiency of their operations and saved them time, money and materials in the process.

In 2016, Western Forge Corporation (WFC) in Colorado Springs identified its shotblasting operations as a source for possible improvements. While their day-to-day processes include much more than shot blasting, this was the area noted as a constraint to their overall process. The process begins with the shearing operation by cutting steel bars to a set length. The billets are then formed using a forging hammer that deforms the billets between two dies. The formed parts are trimmed by a trim press. The parts are then shotblasted, annealed and shotblasted a second time to free them from any debris.

WFC recently purchased and installed a 14-cubic-foot drum-blast machine to replace two older drum-blast systems from a competing supplier. The drum-blast machine has improved productivity, maintenance downtime, and shot and replacement-parts cost savings.

The Application

WFC's previous shot-blast machines had limitations and could not keep up with the demand and production of the other processes. Based on this, WFC began looking at solutions to fix this bottleneck. After much time searching out shotblasting manufacturers, checking references, conducting site visits and checking the quality and engineering of the equipment viewed, they decided to partner with Blast Cleaning Technologies (BCT), New Berlin, Wis., on this project.

BCT performed some tests on the challenging forgings that Western Forge produces. These are mainly hand-tool components

that are prone to nesting and typically tear other types of blast machines apart, which creates constant unscheduled downtime. By testing the parts in-house, BCT was able to custom-design the proper drum for WFC's products. It ended up providing more production than the two current drums machines combined.

"During the testing at BCT, we found that we were able to reduce cleaning times to one-fourth or less of the current machines being run at Western Forge," said Carl Panzenhagen, president of Blast Cleaning Technologies. "We've developed a design to blast clean hand tools that is extremely innovative and cost-effective for our forge customers."

WFC chose to remove two old drum-blast systems and replace them with a completely new drum-blast design that could handle the capacity of both of the old tumble-blast systems.

"Production was never stopped for this installation, and we experienced very little downtime because we kept one of the old machines running until the new machine was installed," said Kyle Dessart, forge and anneal engineer, WFC. "We worked around the schedule with long days and weekends to complete the install with little-to-no impact on production."

Installing the new blast-cleaning system and having little-to no impact on production did prove to be a logistical challenge due to spatial constraints. BCT engineers visited the facility prior to installation, field-measured the area and, along with the team from WFC, made a few minor modifications to the original plan and layout.

"Blast Cleaning Technologies made some design changes to the original layout and got everything in place with room to spare," Dessart said.

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Western Forge Upgrades

Software Advantages

"The best feature to me is the new software that BCT developed specifically for Western Forge, Dessart said. "BCT worked with us to ensure that all our needs were met. The software ensures that the equipment is maintained properly and that it is always running in optimal condition. Another great feature is the solid build; the equipment is heavy-duty and very durable."

BCT designed the program, and it was custom-written to meet WFC's needs consistent with the use of this particular drum-blast equipment system. The system was designed to monitor the following:

- The reclaim system, which includes the separator, elevator, augers, abrasive hoses and the greasing of bearings at 24-, 100- and 500-hour intervals
- The blast wheels, which includes checking the wheels, tune-up kits, housings, liners, bare wheels and lubrication of bearings at 100- and 500-hour intervals
- The blast cabinet, which includes the general cabinet, doors, shafts, bearings and cylinders at 500- and 700-hour intervals
- The loader assembly, which includes a hydraulic pump, general condition, oil seals, oil change and proper lubrication of SEW gear motors
- Recommended lubrication for mounted ball bearings and tapered roller bearings
- Shot data records
- Preventive-maintenance checklists

This program monitors the hours of the machine. After every 10-12 hours, a banner pops up and lists the maintenance items that are required before the machine can be restarted. The operator is forced to stop the machine, key in a password and complete the quick maintenance checks, at which time a date and time stamp are logged into the system showing completion of required maintenance. This information can be downloaded directly to a USB stick and loaded into a spreadsheet log of the maintenance history.

Benefits of New Installation

When replacing and updating blast machines, there are several areas for cost savings, and WFC is benefiting from all of them. WFC's Dessart provided the following information.

- **Shot Savings:** Annual usage was previously 80,400 pounds annually, which was reduced to approximately 26,000 pounds, for savings of approximately \$21,000 per year.
- **Parts Usage and Savings:** No significant parts usage after eight months, just minor adjustments that are expected with a new machine. This style of machine reduces pinch points and jamming with fewer moving parts than the traditional-style tumble blast.
- **Cycle-Time Reductions:** Cycle times have been reduced by



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Western Forge Produces Premium Hand Tools

Western Forge Corporation (WFC) of Colorado Springs, Colo., is a subsidiary of Ideal Industries, Sycamore, Ill. Founded in Defiance, Ohio, in 1965 as a torque-wrench manufacturer, the company relocated in 1966 to Colorado Springs, building new manufacturing facilities to take advantage of the high-altitude, low-humidity environment that is optimal for steel production. In 2009, WFC became a wholly owned subsidiary of Ideal Industries and continues to manufacture finely crafted American-made steel

for premier hand tools.

Upon making the move to Colorado, WFC expanded production to include screwdrivers, punches, chisels, adjustable wrenches and pliers. In 1976, it shipped its 100 millionth screwdriver. WFC's manufacturing plants in Colorado Springs are an American standard of premier metal craftsmanship, offering forging, heat treatment, handle extrusion, machining and plating operations.

50-75% on all products.

- **Production Improvements:** Blasting is no longer a constraint to the process. We are keeping up with production and running the machine only 8 hours/day, compared to running two machines 24 hours/day.
- **Maintenance Impact:** Thus far, there really hasn't been a cost associated here. We expect the annual PM cost to be under \$10,000 for this new drum-blast system, which is significantly less than the two systems we replaced.
- **Improvement in Downtime:** We have not experienced any real downtime on the equipment. The old blast systems went down at least once a week for approximately four hours at

a time. We have had only a few times when the machine went down, but the remedy was as simple as checking the machine and rebooting it.

- **Electrical Savings:** The new drum-blast equipment runs the equivalent of one-sixth of our previous units combined, and this saves energy. Quantifying the exact amount is difficult, but we know there is less energy drawn than before.
- **Safety Access:** The addition of the machine has not only improved our production, but the service platforms engineered into the existing equipment design have improved safety and maintenance access to the machine.

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Western Forge

Conclusion

According to BCT's Panzenhagen, "When we first visited Western Forge, it was clear to us that BCT would be a great fit. We knew the improvements we had designed into our drum system would have a huge impact in their operation, and getting them from a three-shift operation to a single-shift operation is something we are very proud to have accomplished."

This was a turnkey project including installation and start-up of the equipment, and it required a lot of communication and project planning.

"Service after the sale is critical for our customers, and we worked together with Western Forge during the install and continue our efforts to support them daily through phone, email and service visits - whatever it takes," Panzenhagen concluded. ♦

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