

Bodycote Hot Isostatic Pressing Plant

www.bodycote.com



"Since getting Wonderware, we've noticed a decrease in product run-wrongs and parts that need re-processing."

Shawn Crawford
Plant Engineer

Wonderware Software Helps HIP Plant Profit through Improved Process Control and Proactive Maintenance

Goals

- Improve control and consistency of furnace temperatures
- Enact a proactive maintenance program to save equipment costs
- Provide better tools to increase operator efficiency and accuracy
- Reduce product re-runs

Challenges

- Existing data system did not provide historical information or useful reports
- Uniformity of temperatures difficult to control between furnace units of different sizes
- Maintenance scheduling based on calendar dates, not run times or performance data

Solutions and Products

- Wonderware® System Platform
- Wonderware InTouch® HMI
- ActiveFactory® Data Analysis and Reporting Software
- Wonderware Historian Software
- Wonderware SCADAAlarm™ Event Notification Software

Results

- Proactive maintenance program enabled steady productivity and better planning of capital expenditures
- Recipes have increased run-over-run product consistency and customer satisfaction
- Operator efficiency improved; fewer operators accomplish more work with better accuracy
- Reports provide more visibility and help facilitate better decision making



London, Ohio – No doubt, most everyone in manufacturing today knows what it feels like to be under intense pressure. But how about 30,000 pounds per square inch (psi)? For Bodycote, a plant that provides hot isostatic pressing (HIP), that's business as usual.

The plant processes parts for jet engines, gas turbines, automotive assemblies, medical components such as replacement joints and other items which must be made as strong as possible. In the HIP process, the parts are subjected to extreme heat and pressure, which makes them less porous and more resistant to stress fractures.

Control is Critical

At Bodycote, multiple furnace units serve the plant. Customer parts are placed in a furnace, which is filled with argon gas. Then the unit is pressurized and heated from room temperature to approximately 2,000°F, which takes about two hours. This high temperature is maintained throughout the process, then the furnace is cooled and the parts are removed and inspected.

HIP quality depends on consistency and repeatability. Bodycote's customers rely on the plant to provide a uniform process, so discrete batches of product show consistent strength and density characteristics, run after run.

Keeping the plant's units in top condition is very important. If a furnace were to malfunction, Bodycote would be forced to re-run the batch of parts. Worst case, Bodycote might have to replace the parts completely, which would have a severe effect on profitability.

Another factor is that Bodycote's furnaces are physically different in size. Each unit heats and cools on a unique schedule, which must be controlled carefully in the HIP process and supervised by plant operators.

Additionally, Bodycote has to monitor its use of argon gas carefully. The pumps and valves on each unit control the pressurization of the gas, which is very expensive. So maintaining the units in good working condition to prevent leaks is key to saving money.



Strengthening the System

These challenges – providing consistent processes, maintaining the varied equipment and conserving resources – mean that Bodycote is always on the lookout for the right operations management software solutions that can help the company succeed. The plant also needs these systems to help maintain its ISO 2001 certification.

Wonderware Cincinnati, the regional Wonderware distributor, worked with American Isostatic Presses, a local VAR and System Integrator, to recommend additions to Bodycote's data systems. Their goals were to help Bodycote implement a preventative maintenance system, get improved visibility to operations data and increase operator efficiency and accuracy.

Shawn Crawford, Bodycote Plant Engineer, appreciates the teamwork that went into the effort, "Everyone did a great job of using the Wonderware software to produce a user-friendly system that's quite outstanding."

A Better Way to Manage Maintenance

With the new Wonderware software, Bodycote made a significant change to the way it schedules maintenance for the furnace units and supporting pumps, valves and components.

Before, the plant managers used a calendar to plan upcoming maintenance. For instance, vacuum pumps were estimated to need repair or replacement every six months. At that time, the pump would be taken off-line for inspection, regardless of whether it exhibited any signs of wear and tear or sub-standard performance.

But with Wonderware System Platform and InTouch software, accurate real-time data on the operation of all of Bodycote's equipment is available. This has enabled operators to monitor valves, pumps and other parts closely, and perform maintenance only when it's actually needed. This not only helps the plant achieve a higher level of productivity, but it also enables operators to repair equipment before failures can occur.

Additionally, operators can watch overall operations for the furnace units and other areas of the plant from one location. This means that fewer employees can do more work and, because of the reliability of the system, they can also perform extra duties during their shifts.

But real-time data is not the only advantage Bodycote gets. The Wonderware Historian software provides management with the historical data they need to extrapolate furnace life and better plan for future capital expenditures. Because millions of dollars worth of equipment are required for the HIP plant, this is extremely important.

Superior Process, Superior Product

Before adding Wonderware software, Bodycote's operators used "touch and feel" to regulate power to the furnaces and maintain consistent temperatures. With the different furnace sizes and other variables in the environment, even the most experienced operators were put to the test.

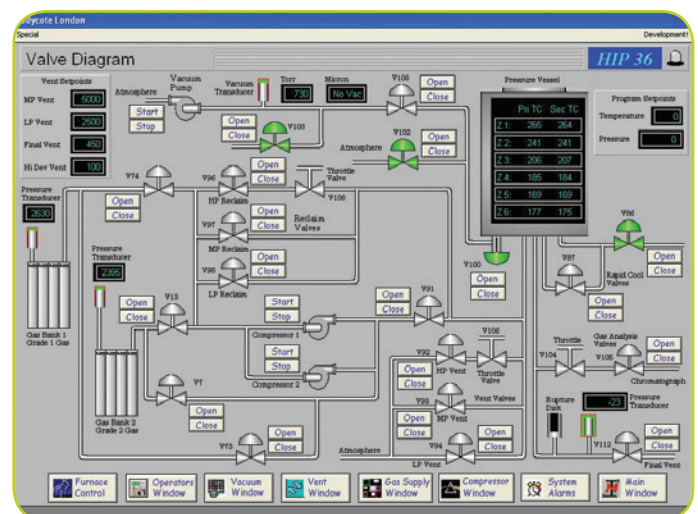
With the new system, recipes for repeated batches are programmed into the Wonderware software. This has improved consistency over multiple runs, and has increased customer satisfaction. When a customer has a question, it can be answered quickly and in detail, thanks to the new reporting capabilities. The reports can prove adherence to a recipe, or can pinpoint the exact time and parameters of a change in the process.

The need to re-process parts due to temperature fluctuation or operator error has been nearly eliminated, and Wonderware SCADAAlarm™ software alerts operators to equipment that needs attention, or triggers an automatic shutdown if a pre-determined threshold is exceeded.

Best Feature: User Interface

When asked, Crawford is quick to point out that the most important feature of the new Wonderware software solution has been its usability. He says that everyone in the plant enjoys working with it. Diagrams and on-screen icons representing equipment, configurations and recipes are easy to see clearly and quickly understandable. He points out that there are many different screens, but not so many as to confuse operators – even less-experienced ones.

As a matter of fact, Bodycote plans to use the Wonderware software for training. Example runs and problem situations can be simulated so that operators can learn how to best react. And these exercises can be accomplished without taking the plant systems offline, so there's no impact on productivity.



Versatility under Pressure

The Wonderware software has brought Bodycote the stability and repeatability required to turn out consistent products for its customers. It has improved preventative maintenance and the ability to cut costs for resources such as argon gas as well as reduce expenses due to production errors. And not only that, the new solution has been popular with management and operators alike.

Crawford feels that Bodycote has just scratched the surface of the Wonderware software's capabilities. He hopes to implement new ideas he has been developing for utilizing data and reports for additional efficiencies and savings. The versatility of the solution and the resourcefulness inherent in Bodycote should enable the plant to continue to withstand market pressures – and succeed – for quite some time.



i n v e n s y s

Invensys • 5601 Granite Parkway III, #1000, Plano, TX 75024 • Tel: (469) 365-6400 • Fax: (469) 365-6401 • iom.invensys.com

Invensys, the Invensys logo, ArchestrA, Avantis, Eurotherm, Foxboro, IMServ, InFusion, SimSci-Esscor, Skelta, Triconex, and Wonderware are trademarks of Invensys plc, its subsidiaries or affiliates. All other brands and product names may be the trademarks or service marks of their representative owners.

© 2010 Invensys Systems, Inc. All rights reserved. No part of the material protected by this copyright may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, recording, broadcasting, or by any information storage and retrieval system, without permission in writing from Invensys Systems, Inc.