



## New Rule, New Equipment

Fabricators and manufacturers move toward Cr(VI) standard compliance

*“Nothing says  
healthy living  
like a breath of  
fresh air”*

**N**ow that OSHA's new ruling on hexavalent chromium is official, fabricators and manufacturers across the country are examining their plants, monitoring their air, and making adjustments to reduce their permissible exposure limits (PELs) to the fumes produced specifically by stainless steel welding.

A magazine article made Greg Faulkner think about improving welding ventilation at his workplace last year.

Faulkner, senior manufacturing engineer at Henny Penny Corp., an Eaton, Ohio-based food service manufacturer, knew that the high ceilings and air-conditioning equipment already in place were a good start.

But the company welds stainless steel plate and castings for the fryer pot assemblies used in its fryers. With the Occupational Safety and Health Administration's (OSHA) new ruling on permissible expo-



*RoboVent CrossFlow System for an Automated Process.*

sure levels (PELs) for hexavalent chromium [Cr(VI)], he knew more safeguards would be necessary.

OSHA's new standard requires that general industry, construction, and shipyards reduce the Cr(VI) PEL to 5 micrograms per cubic meter. The previous PEL was 52 micrograms per cubic meter.

Respiratory protection and engineering controls must be in place by Nov. 27 for employers with more than 20 employees and by May 30, 2007, for employers with fewer than 20 employees. Feasible engineering controls must be in place by May 31, 2010.

### **Determining a Need**

"Nothing says healthy living like a breath of fresh air" was the article that made Faulkner start digging into Henny Penny's possible new welding ventilation needs (The FABRICATOR, August 2005, p. 42).

"I kept it as a reference because I liked the chart so much," Faulkner said. Although the

company mostly uses gas tungsten arc welding (GTAW), has ceiling heights of at least 24 feet, and has an air-conditioning unit that exchanges air continuously, two manual gas metal arc welding (GMAW) stations that use stainless steel wire were a concern.

Faulkner read as much as he could about welding ventilation to understand the air-monitoring numbers involved. He spoke with his director of operations—a welding engineer by trade—and a company health and safety representative to start investigating ventilation systems that would help them meet OSHA's new standard.

*RoboVent CrossFlow System for a Manual Welding Process.*



At the time the company's GMAW stations were emitting 50 micrograms of Cr(VI) per cubic meter—below OSHA's previous standard, but above its new standard. But first Faulkner had to recalculate air-monitoring numbers because older measurement reports were in milligrams.

Faulkner visited other shops, many of which used robotic welding and RoboVent units from RoboVent Product Group, Clawson, Mich. Although Henny Penny doesn't automate any welding currently, the company is investigating different welding automation options.

Faulkner also noticed RoboVent systems in place at welding robotics integrator Genesis Systems Group, Davenport, Iowa, during a visit to discuss robotic welding.

Next Faulkner attended the FABTECH® International & AWS Welding Show in 2005 to talk with welding ventilation representatives to see what types of systems might fit their two GMAW stations.

Although he had seen the RoboVent-products intended only for robotic welding workcells, Faulkner stopped by the com-

pany's booth to investigate possible options for manual welding stations. Then he started talking with a RoboVent representative from Northland Air Systems, Cleveland, who visited Henny Penny's manufacturing facility.

## The Right Fit

Ergonomically designed for the welder, Henny Penny's GMAW stations have everything the welder needs within reach, so Faulkner wanted to make sure that any ventilation system would capture the fumes at the source effectively—but wouldn't obstruct the welder's ergonomic setup. In addition, because only two stations needed to be fitted with new ventilation equipment, Faulkner didn't want to have to re-duct the entire manufacturing facility to install a permanent unit. Above all, the system had to help the company reduce its PELs.

During a WeldPro demonstration at Henny Penny, an Ohio Bureau of Workers' Compensation representative performed an

eight-hour test to make sure that the PELs were compliant with OSHA's standard. The resulting PELs with the new ventilation system were 0.072 microgram per cubic meter—a third of the action level.

Although Henny Penny's situation was resolved relatively seamlessly, Faulkner acknowledged that this is just one example of re-engineering for OSHA compliance.

"Some people would laugh at me and say what you had to do was easy," he said.

## Steps to Take

Faulkner is the first to admit that ventilation is an investment that must be considered wisely, especially from a financial standpoint.

"In any given environment, you can ask



*RoboVent WeldPro for a Manual Process.*

for only so much capital money in a year's time," he said. Henny Penny budgeted for new ventilation equipment at the beginning of the year to prepare for its investment.

But plenty of other factors also must be considered, according to Gary Q. Johnson, P.E.

An industrial ventilation consultant, Johnson has experience in health and environmental safety and is a member of the American Conference of Governmental Industrial Hygienists' (ACGIH's) Industrial Ventilation Committee.

Johnson said it's challenging to adhere to the more stringent OSHA fume exposure regulations with manual welding.

"It's a human process. The person's going to move," he said. Because of this, companies should develop ventilation approaches that won't interfere with the welder's work. "You have to consider the

### **Gary Q. Johnson, industrial ventilation consultant, recommends taking the following steps when choosing a new ventilation system:**

1. Copy other shops' successful ventilation ideas if their manufacturing operations match or resemble yours.
2. Find out what works for your company—welders might be forced to wear respiratory protection if an equipment solution can't be found.
3. Work with your company's experienced welders to get them onboard with new ventilation practices to make sure that everyone is following them correctly.
4. Demonstrate that the new standard works with air sample and ventilation system measurements.
5. Establish a standard practice and train everyone on it.
6. Put behavioral management in place to make sure everyone complies.
7. Plan for routine exhaust ventilation system airflow or static pressure checks to demonstrate that the system continues to perform as demonstrated at start-up.

realities of the job they do.”

One option is point-source fume capture, which isn't always practical.

“When a welder's on a good roll, he's not going to want to stop [to move a] point-source control,” Johnson said. “Any point-source hood should be above where the welder's welding. You need to take advantage of the thermal buoyancy for the welding fumes to go up.”

Another choice is a bench-type system. Johnson cautions that companies must make sure welding hoods aren't too close to the welding. In addition, he said, hoods can be limited in how much air they can capture, based on the suction hood's diameter and

how far it is away from the work.

Once a system is in place, Johnson emphasizes that ducts will need to be cleaned regularly. The static pressure system-monitoring methods mentioned previously will

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give early warning of developing problems without the need to look inside the ducts.

“People need to realize that there's go-

ing to be more of the chrome stuff in the roof and up in the duct, so when workers clean it, companies need to have safe practices in place to deal with the exposure risk,” he said.

Once new ventilation practices and systems are in place, everyone can work more safely and productivity will improve, Faulkner said.

“I talked to the welder who works this cell, and he loves the difference, the way he can do his work, the way he feels. There are all sorts of benefits to it,” Faulkner said. “You get productivity improvements that are hard to quantify, but when people feel better, it makes productivity better.”

