

Application Report

AR-143

Unique Eclipse Multi-Flame Monitoring System performs flawlessly in Vectra Fitness' powder coating operations

In the face of higher production demands, Doug MacLean, president of Vectra Fitness, Inc., decided to bring the company's powder coating finishing operations in-house, instead of outsourcing the process. "Increased orders were driving our need for higher volumes and on-time production. Our off-shore supplier simply couldn't keep up," he explains. "We also knew we could achieve better and more consistent quality by doing the powder coating ourselves."

Vectra Fitness designs and manufactures pin-selector weight training machines under its own brand name for consumer and institutional markets worldwide. The company is vertically integrated, manufacturing and assembling all components of its weight machines in a 65,000-square-foot facility in Redmond, Washington.

Vectra's in-house capabilities encompass a wide range of metalworking and assembly techniques—from tool and die making, machining, stamping and welding to specialty molding and upholstery. The decision to set up a powder coating line to finish large quantities of 5-, 10- and 15-pound cast iron weights was completely consistent with Vectra's quality control philosophy.

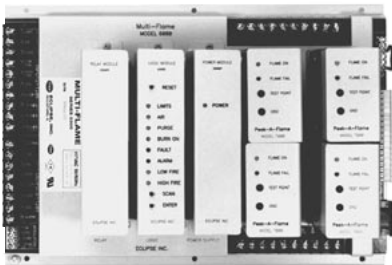
According to MacLean, "The powder coating line is a major part of our manufacturing process. We use about two million pounds of cast iron a year to produce hundreds of thousands of machine weights. It was essential that our powder coating operation be fast, efficient and cost-effective, with minimal downtime. That's the reason we chose infrared (IR) over convection heating for the powder coating curing process. IR technology satisfied both our production time and quality requirements."

The Multi-Flame Monitoring System optimizes Eclipse IR burner performance

Vectra turned to Dave Muir, sales manager at Eclipse Combustion Inc.'s Seattle office for IR burner recommendations. Working closely with the Eclipse engineering team in Rockford, Illinois, Muir was able to provide different types of burners to be used in laboratory tests as Vectra fine-tuned their powder coating process. Once the burners were selected, the Vectra engineering team custom-designed and built the curing oven and conveying system around them. The oven is equipped with four rows of Eclipse Series 67 IR burners.

To optimize the oven's performance, Muir recommended that Vectra install the recently developed Eclipse Multi-Flame Monitoring System (patent pending), which represents a whole new concept in multiple burner monitoring and control. This microprocessor-controlled unit would provide an integrated system to monitor, troubleshoot, diagnose and control all four rows of burners, ensuring optimum burner performance and, ultimately, maximum productivity.

Although Vectra's technical team built and installed the system, MacLean asserts that Eclipse was right there when needed. "Eclipse gave us good support," he says. "We installed the IR oven system ourselves, including the Multi-Flame Monitoring System. Then Dave came in with Eclipse engineer, Gary Wild, and they checked out the entire installation before we started it up."



The Eclipse Multi-Flame accommodates all the modules needed to monitor and control up to four burners. Four additional burners may be monitored by adding an expansion board.

How the Eclipse Multi-Flame Monitoring System works

With solid state controls and small plug-in modules, the Eclipse system is the most compact multi-flame monitor on the market today. The unit's mother board accommodates all the modules required for monitoring and control of up to four burners. The addition of an expansion board allows monitoring and control of up to eight burners.

The Multi-Flame Monitoring System's logic module houses the microprocessor which provides the sequential logic as well as safety startup and shutdown circuitry. Status lights and pushbutton controls are clustered on the face of this module. The unit's relay module contains the output relays that provide power for the ignition coil, pilot valve, main valve, combustion fan and alarm.

The system's Peek-A-Flame modules are the actual flame-sensing devices, with each burner requiring one of these modules. The "Flame On" LED on its front glows when the flame is on and flashes if there is a flame failure. Test jacks on the face allow signal strength to be measured with a volt meter.

Optional features of the Multi-Flame Monitoring System include a communications interface, which provides relaying of information to a remote computer, remote alphanumeric message display for real-time status monitoring, history logging of the last ten lockouts, total number of cycles from startup, valve leakage interface to an external gas leak detector, four auxiliary safety inputs, and modulation interface to a motorized actuator.

Simple, smart, safe and reliable flame monitoring

In Vectra's powder coating area, MacLean's manufacturing staff appreciates having a "smart" flame monitoring system that ensures burner safety, especially one that's as easy to

use as the Eclipse Multi-Flame Monitoring System. He says: "You just turn it on and the controller automatically runs through its startup and safety procedures. It turns on the exhaust fan to purge the oven, measures the gas and air pressures, turns on the gas, lights the burners and continually monitors every flame. If there's a problem with any flame, the burners are shut down and a message is displayed."

Vectra's system was specified to include the optional alphanumeric message display, a feature MacLean says is extremely useful for real-time status monitoring as well as for periodic burner maintenance reminders.

Now that the Eclipse Multi-Flame Monitoring System has been in use for nearly two years in Vectra's powder coating curing line, MacLean has been able to assess its longer term benefits, namely performance and reliability. "The flame monitoring system's performance has been 100 percent flawless, with absolutely no problems. As to maintenance, over a two-year period, we haven't had to do a thing."

Although there are no plans at present for expanding heating applications at Vectra, MacLean asserts, "If we ever need to add more ovens and burners to our manufacturing processes, we'll go to Eclipse first because of the excellent performance of their products and the level of service we received."

Muir notes that Vectra Fitness was one of the very first manufacturers to use the new system. "The Eclipse Multi-Flame Monitoring System, which complies with NFPA standards, was ideal for this application," he says. "With Vectra's production line relying on the speed, efficiency and performance of its IR curing process, backing up burner performance and ensuring safety and timely maintenance makes good business sense. For heating applications in complex manufacturing environments, having the Multi-Flame Monitoring System on the job gives you one less thing to worry about."



Vectra Fitness uses about two million pounds of cast iron a year to produce 5-, 10- and 15 pound weights.



Vectra Fitness engineer checks Multi-Flame monitoring system that's performed flawlessly since its installation two years ago.

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