

High efficiency radiant tube inserts save heat-treating company \$37,000 in first year

CASE STUDY

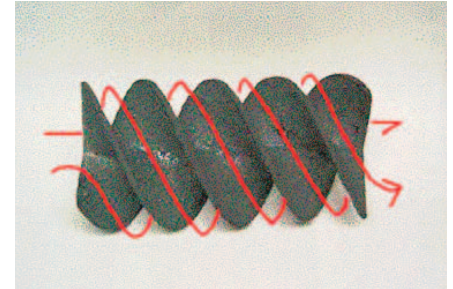
Like most companies, Treat All Metals in Glendale, Wisconsin, was concerned about the rising cost of energy. As a heat-treating facility that relies heavily on natural gas for its daily operations, Treat All sought ways to improve the efficiency of its furnaces. When the company learned of a new, easy-to-install technology that promised to reduce gas consumption by 10 percent with a one-year payback, it seized the opportunity.

The result? Treat All reduced natural gas consumption in two of its furnaces—one by 11 percent and the other by 15 percent—and saved \$37,000 in the first year alone, for a one-year payback. How did they do it? With the help of a new radiant tube heater insert called SpyroCor™ and financial incentives from Focus on Energy, Wisconsin's energy efficiency and renewable energy initiative.

THE OPPORTUNITY

Treat All is one of about 90 heat-treating facilities in Wisconsin. Like most heat-treatment plants, Treat All employs multiple furnaces. The furnaces maintain temperatures of 1,000°F to 2,000°F and may contain up to a dozen radiant tube heaters each. Each radiant tube has a natural-gas-fueled burner at one end and an exhaust leg on the other end. The radiant tube is heated internally by the burner and the product in the furnace is heated by the tube. Heat treating is typically done to improve the mechanical properties of the part for final use or for a subsequent manufacturing operation.

The problem with radiant tube heaters is that a large amount of heat produced by the burner escapes with the exhaust gases before it can be used for heat treating. Installing the inserts improves the heat output from each tube, transferring more heat back into the furnace and wasting less through the exhaust.



RADIANT TUBE INSERTS COME TO WISCONSIN

Manufactured by SpinWorks, LLC, of Erie, Pennsylvania, SpyroCor inserts come to Wisconsin through a collaboration between SpinWorks and CleanTech Partners (CTP), a private, nonprofit organization that facilitates the commercialization of new technologies in Wisconsin industry. CTP first identified this promising technology at a U.S. Department of Energy-sponsored conference in October 2004. After an in-depth assessment of the product and its creator to make sure that both delivered on their promises, CTP partnered with the company to bring its natural-gas-saving technology to Wisconsin's metals industry. Treat All Metals was one of the companies they approached.

THE SOLUTION

SpyroCor radiant tube inserts (pictured) are high-tech ceramic (silicon carbide) sleeves capable of reducing natural gas use in radiant tube heaters by 10 percent to 30 percent. The inserts' patented twist design produces a non-turbulent, high-convection flow that transfers heat more uniformly, reducing heat loss and the total amount of energy required by the process. Their application to a standard radiant tube helps to retain heat inside the furnace, reducing the need for additional natural gas. The technology offers other benefits as well, such as reduced cycle duration and reduced emissions of nitrogen oxide and carbon dioxide.

To learn more about Focus on Energy, call 800.762.7077 or visit focusonenergy.com

Treat All Metals, located in Glendale, Wisconsin, specializes in heat treating industrial metals with processes ranging from -120°F to 2,200°F. Processing includes case hardening, quenching and controlled-atmosphere hardening. Treat All can heat-treat components of all sizes up to six feet wide and nine feet long. The company is proud of its excellent technical talent and state-of-the-art equipment. Treat All agreed to be a Focus on Energy demonstration site for this emerging high efficiency product. By being a leader, the company has reduced its natural gas consumption in one furnace by 11 percent and in another by 15 percent.

Radiant tube inserts are easy to install and may be installed “hot” during furnace operation, eliminating the need for costly downtime. Typically 6 inches to 12 inches in length, the inserts are manufactured slightly smaller in diameter than the tubes into which they are placed. Depending on the application, two to eight inserts are placed inside the exhaust leg of each radiant tube. Savings are measurable immediately. Extremely durable, with a life expectancy of more than five years, the inserts often outlast the tubes into which they are installed. Their reuse depends only on the ability to remove them from the tube when the tube is replaced.

PROJECT BENEFITS

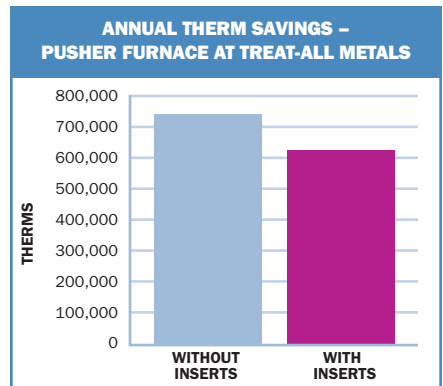
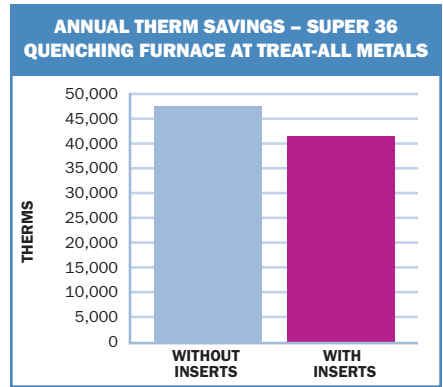
Plant staff at Treat All installed the radiant tube inserts in two furnaces—one a large pusher furnace and the other, a smaller quenching furnace. The number of radiant tube inserts required in typical applications range from 20 to 100 inserts per furnace, depending on furnace size. “It was surprising how quickly the inserts could be put into place,” said Dave Perez, Treat All maintenance manager.

After installation, Focus on Energy assisted Treat-All in measuring the results. They found that the inserts reduced natural gas consumption by 11 percent in the large furnace and by 15 percent in the smaller one. These savings exceeded the 10-percent guarantee offered by the supplier and reduced the cycle times of the smaller furnace to allow for more heat-treat cycles per day.

“By improving heat transfer, we reduced our cycle times and the natural gas savings paid for the cost in a year,” said Glenn Strehlow, Technical Operations Manager at Treat All. “Impact on tube life was the only concern we had, and this is gone after a year of operation without any effect on tube life,” he added.

SPECIAL FOCUS INCENTIVE

To encourage other heat-treating companies to install radiant tube inserts, Focus on Energy is offering a \$100 incentive for each insert installed by June 30, 2008. Contact your Focus on Energy Advisor to apply for this incentive.



HOW CAN FOCUS ON ENERGY HELP YOU?

Focus on Energy provides free, specialized energy best-practice support for Wisconsin industrial energy efficiency projects. Services include project financial incentives, feasibility studies, evaluation of options, measurement and verification of savings, energy best-practice training and tools for managing energy.

“Focus on Energy has been a good partner in helping us identify new ways to save energy at our facility.”

– Glenn Strehlow

Technical Operations Manager

Companies wishing to improve their heat-treating systems with energy efficient technologies may contact a Focus Energy Advisor. Focus will review the planned projects with an eye toward maximizing savings from the upgrades.

Companies may also contact a Focus Business Ally for project support. Equipment designers and service providers who are not already Focus Program Allies may become an ally by contacting Focus on Energy.

PROJECT TEAM

■ Treat All Metals, Inc.

Purchased and installed the radiant tube inserts

■ Focus on Energy

Conducted measurement and verification and provided a demonstration grant

■ SpinWorks, LLC

Provided energy analysis and the technology and guaranteed the savings

Focus on Energy works with eligible Wisconsin residents and businesses to install cost effective energy efficiency and renewable energy projects. Focus information, resources and financial incentives help to implement projects that otherwise would not get completed, or to complete projects sooner than scheduled. Its efforts help Wisconsin residents and businesses manage rising energy costs, promote in-state economic development, protect our environment and control the state's growing demand for electricity and natural gas. For more information call **800.762.7077** or visit focusonenergy.com.

