

Natural gas heat treatment furnace

Cuts costs, streamlines production

Arrow Tank and Engineering Inc.
Cambridge, MN

- Natural gas heat treatment furnace
- 32-million BTU heating capacity
- Heats to 1,700° F
- Handles up to 200-ton loads



A special insulated furnace rail car carries the load to be heat treated from the loading area in front of the furnace directly into the furnace. Time spent in the furnace depends on the material, thickness and the heat treatment required to meet the AWS (American Welding Society) or ASME (American Society of Mechanical Engineers) code.

A do-it-yourself project of grand proportion

Eager to reduce its operating expenses and streamline production, Arrow Tank and Engineering Inc. expanded its facilities with a state-of-the-art, computer controlled and monitored natural gas heat-treatment furnace. This Cambridge, Minnesota, company is a worldwide fabricator of custom ASME pressure vessels for the water treatment, refinery, chemical, pharmaceutical, food and air gas industries as well as propane transport truck tanks and CCS fire suppression vessels.

Furnace handles heavy loads

Specifically designed to relieve stress of welded joints in metal fabrications, the heat-treatment furnace can handle loads up to 200 tons and heats to a maximum of 1,700 degrees Fahrenheit, delivering temperature uniformity within +/- 25 degrees Fahrenheit. Because of its large size, the furnace is housed in its own building. It has 32 burners rated at 1,000,000 BTUH for a total of 32,000,000 BTUH heating capacity, will handle 18-foot diameter × 73-foot long round loads and 16-foot wide × 14-foot high × 73-foot long loads and will stress-relieve aluminum, steel and stainless steel.

Collaboration helped move the project forward

Arrow Tank began its heat-treatment furnace project in January 1998. From conception to construction and from design to implementation, they knew exactly what was needed.



Joe Stitz of Arrow Tank stands in the entrance where rail cars enter the new Arrow Tank heat treating furnace.

Arrow Tank exceeded its expectations

They have:

- reduced operational costs
- improved turnaround and delivery time
- installed an energy efficient system...one they designed and built themselves
- improved customer satisfaction

The company decided to engineer and oversee the project themselves and turned to CenterPoint Energy to help get the job done right. “When I first called CenterPoint Energy, and described the furnace we wanted to build, they couldn’t wait to get started,” said Joe Stitz of Arrow Tank. “They were a great help getting the natural gas to our site and helping us qualify for CenterPoint Energy conservation rebates by adding efficiency features such as extra insulation and a state-of-the-art burner system.”

Dual benefits

“Natural gas was the best choice for many reasons,” Stitz stated. “The key reason: economy. Electricity would have been more expensive to use and maintain. But economy is not the only plus with natural gas. The natural gas, along with the excess air, also increases the chamber air velocity as it heats it. This built-in benefit delivers a more uniform temperature during the heat-treatment process without additional equipment. With electricity, we would have had to install expensive, high temperature fans and that would have used more energy.”

Rebates and operational savings help speed payback

Arrow Tank’s new furnace eliminates the need for an outside supplier for heat treatment services. Arrow Tank now has total control of the project, eliminating delays so they’re more competitive and can manufacture larger and heavier tanks.

Arrow Tank’s decision to build their own furnace was a wise financial choice. Their involvement in the project from the beginning helped CenterPoint Energy determine the best way to deliver and use natural gas. CenterPoint Energy also helped Arrow Tank make the final decision to go ahead with the project.

Now fully operational, the furnace is providing a good payback for Arrow Tank.

For more information

The Arrow Tank natural gas heat treatment furnace is available for commercial use. For more information, contact Joe Stitz at Arrow Tank, 763-689-3360; or joe@tank.arrowtank.com. Or visit www.arrowtank.com.