

Gas-fired solutions for tin baths

BILL HOBSON DESCRIBES TWO SITUATIONS WHERE ENGINEERS WERE CALLED UPON TO PROVIDE HEATING SOLUTIONS FOR FLOAT GLASS LINES

Eclipse is a leading source for industrial process heating solutions, offering an extensive array of burners and systems for the glass industry. Recently, Eclipse installed gas-fired auxiliary heating systems in several tin bath operations to improve the heating processes. In the production of float glass, the tin bath section is

traditionally heated by roof-mounted electrodes, primarily due to the atmosphere necessary in this phase of the float glass-making process.

The close proximity of the electrodes to the surface of the tin bath offers good temperature uniformity and heat distribution. In time, however, these electrodes burn out, creating cold spots in the tin bath. By the very nature of float glass production, electrode replacement is virtually impossible without shutting down the glass-making process.

Eclipse worked with two leading manufacturers of float glass to provide alternative solutions to these electrode problems. Using two different types of indirect fired gas burner systems that are

currently employed in high temperature applications for the metals industry, the company was able to develop edge heating systems that successfully solved the problems encountered by each of the glass companies.

THE TUBE FIRING BURNER

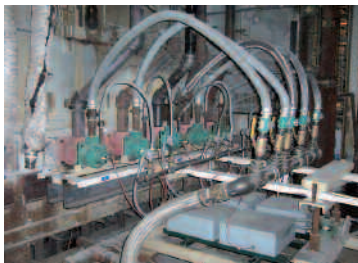
At the first facility, the Tube Firing Burner (TFB) was chosen to best address the edge heating problem. This float glass plant has been operating this particular furnace campaign for seven years. Electrodes hanging from the ceiling heat the tin bath area; problems resulted when the electrodes began to fail. Maintenance personnel could not replace damaged electrodes because the furnace must be shut down in order to do the repairs.

This furnace produces about 600 tons of glass per day. When the electrodes started failing, the tin bath capabilities became the bottleneck in the operation, resulting in production cuts. Another problem arose when the company tried to operate at the maximum width of the tin bath. Because of the loss of side heat, the tin became cooler at the edges, resulting in varying glass thicknesses from side to side. It also took longer for job changes, resulting in an even greater loss of production.

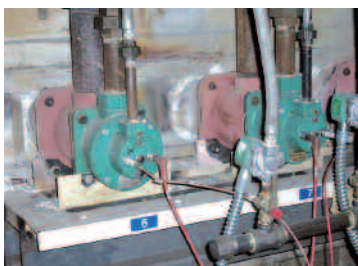
THE HEART OF THE EDGE HEATING SYSTEM

As a solution, Eclipse suggested using a TFB radiant tube burner as the heart of the edge heating system. The atmosphere in the tin bath is made up of inert gases to keep the tin from oxidising. Eclipse recommended a TFB075 with a six-inch diameter tube that provides six feet of effective heating surface inside the furnace, using engineered bends to keep the tube at the proper height above the glass surface. Firing at 85,000 BTU, the system also incorporates a portable skid designed by Eclipse with a Heat Pak control panel, blower, flow control actuator and hoses for easy connections.

As this system is in use only part of the time, it can be disconnected and stored when not in use. Using the new system, the glass profile or thickness is well within specifications. The setup adjustments for new jobs, which had taken up to 45 minutes, are now accomplished in just a few minutes.



OVERALL VIEW OF EDGE HEATING SYSTEM INSTALLED ON TIN BATH WITH FIVE SER AUTORECUPE BURNERS

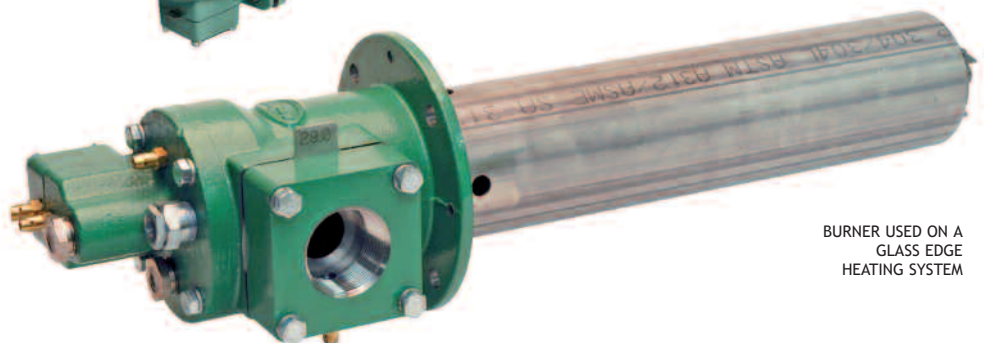


CLOSE UP VIEW SHOWING AUTORECUPE BURNERS AND PIPING



INSIDE VIEW OF TIN BATH SHOWING TFB-FIRED RADIANT TUBE REFLECTED IN THE MOLTEN GLASS

AUTORECUPE BURNER USED IN SECOND EDGE HEATING SYSTEM



BURNER USED ON A GLASS EDGE HEATING SYSTEM



COMPLETE SKID MOUNTED SYSTEM PREPIPED AND PREWIRED FOR PLUG AND PLAY OPERATION ON THE JOB SITE (USING TFB BURNER)

THE AUTORECUPE SER BURNER

At a second glass plant, production staff were experiencing identical problems. At this facility, the AutoRecupe SER burner was recommended as the best solution for edge heating. The AutoRecupe is a self-recuperative burner that provides its own preheated combustion air to provide maximum temperatures whilst reducing fuel costs. It also employs internal flue gas recirculation, resulting in lowered NOx emissions.

The AutoRecupe is ideal for applications requiring indirect radiant heating in inert atmospheres. This glass company had worked with Eclipse several years ago on a test project using gas-fired equipment. In addition, it had heard of the success at the facility described previously using gas-fired radiant tube burners for edge heat.

A CUSTOM GAS-FIRED EDGE HEATING SYSTEM

After reviewing the situation, Eclipse designed and built a custom gas-fired edge heating system using 5 six-inch SER AutoRecupe indirect fired self-recuperative burners with ceramic inner and metallic outer tubes. The system also includes a combustion air blower, valve train, control panel and miscellaneous piping components. The installation proved to be very successful, and all the calculated efficiencies and heat outputs were realised. This allowed the outboard edge of the glass float to stay in a fluid state and production to be maintained. As more electrical elements required replacement, it was then decided to add more AutoRecupe burners.

To date, there is a bank of 10 burners on each side of the float. This has provided not only enough heat to maintain edge heating, but also enough heat for the float to stay in solution during a recent power outage. The plant back-up power could not energise all of the electrical heating elements, but the burner system was able to operate on auxiliary power and keep heat in the furnace.

The AutoRecupe auxiliary heating system offers a new tool for tin bath processes, providing improved edge heating, additional operating flexibility and emergency heat. ■

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