

Eclipse Product: ThermJet Self-Recuperative v5 Direct-Fired Burners

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Application: Tip-Up Furnace with Manipulator System

Description: For over 30 years, Heat Treat Furnaces, Inc. in Sturgeon Bay, Wisconsin has been building heat treat furnaces and ovens to exacting customer specifications. During those years, HTF has relied on Eclipse to provide the burners they need for the various conventional and specialized heat treat furnace systems they build. HTF owner, Dave Smith states, “we build equipment that is specifically tailored to the application; therefore, we need burners that are specifically adapted to our furnaces. Working with Eclipse through the years, we have been able to do that very comfortably.”

When HTF was commissioned to design a combination Tip-Up/Manipulator Furnace with a 45 foot wide work zone, Dave contacted Eclipse. The furnace would need to operate uniformly at 2,000°F. HTF also specified recuperative burners for the furnace to meet their requirements for high performance and energy efficiency. The furnace would need to be designed to ship as a one piece unit, making it plug-and-play operational on delivery.



HTF owner, Dave Smith, with Tip-Up/Manipulator Furnace.

Eclipse provided the solution with (16) TJSR0060 v5 self-recuperative direct-fired burners. With the TJSR v5, a space saving integral eductor pulls the furnace exhaust through an internal ceramic recuperator. The recuperator preheats the incoming combustion air to very high levels, which improves operating efficiency and reduces fuel usage by up to 32% at high fire. According to Dave, “I saw real innovation in this burner that does not exist elsewhere. It’s a pretty neat burner.”

When the completed furnace was test fired at HTF, the results were impressive. The temperature survey using (14) thermocouples verified the furnace consistently operated at 14.4 (MM Btu/hr) within +/- 5°F. The integral TJSR v5 eductor worked well from high fire to low fire. The HTF team was pleased with the burner performance, temperature control and efficiency. To sum up the success of the project, Dave said, “We are proud of this latest addition to our ever growing stable of unique process solutions. At Eclipse, there are people I can talk with and people I have confidence in. Working together, we have always been able to hook up the right burner with the right application.”



TJSR v5 design eliminates the need for the external hot air ductwork required by other recuperative burners. This provided significant cost savings in the furnace design.



The integrated gas and air orifices and pressure taps are located at the front of the TJSR v5. This feature simplified burner set-up and adjustment during furnace testing.



During the initial test firing with the furnace operating at 2000°F, the exhaust temperature test readings were 430°F, exactly as predicted by Eclipse.



The TJSR v5 delivers a precise, stable flame throughout the full input range. The burner features a high velocity flame along with self-recuperation.