

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

**Submitted by:** Tom Heidenreich, SMA Systems

**Application:** High Temperature Furnace Upgrade

**Description:** One of the largest users of natural gas in Northwest Indiana is Valbruna Slater Stainless, Inc., located in Fort Wayne, IN. This North American manufacturing facility produces stainless steel and nickel alloy round bars in a variety of sizes, grades, finishes and thermal treatments. When natural gas fuel prices rose in 2008, it prompted the company to start considering upgrades to their various furnaces to save fuel. Using a proven twelve step process based on an American Gas Association publication and recommendations from Eclipse, their #19 furnace was chosen as the first furnace to be evaluated for conversion. This furnace was equipped with (18) high velocity burners with ambient combustion air.

The funding for this furnace conversion project became available in 2011 when the State of Indiana promoted their "CHIP" (Conserving Hoosier Industrial Power) program. Valbruna Slater Stainless, Inc. was awarded \$180,000 in project dollars. The contract required them to have the upgrade completed and commissioned by January 31, 2012, or funding would be forfeited.

To achieve the energy savings and temperature uniformity required by the customer, Eclipse recommended replacing the existing burners with ThermJet Self-Recuperative Burners (TJSR v5). The TJSR v5 is a direct fired, self-



Original ambient air burners before conversion.

recuperative burner. The advanced burner design combines a high velocity flame with fuel saving recuperation. 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 furnace operating efficiency to reduce fuel usage. The internally insulated heat exchanger section and exhaust housing hold heat in the recuperative section, adding to the heat recovery efficiency.

SMA Systems and Eclipse worked together to develop the piping schematics for the combustion and eductor air and fuel piping. Eclipse delivered all equipment with last minute changes one day earlier than required. Eclipse provided on-site assistance during all project phases, in addition to the final commissioning in January 2012.

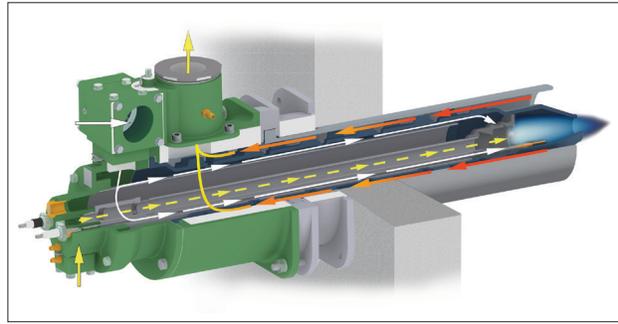
## Customer Benefits

The complete retrofit installation included high performance self-recuperative burners, burner controls, UV scanners, and combustion/eductor air blowers. Despite the short project lead time, Eclipse met the contract funding deadline and the furnace efficiency was greatly improved.

Valbruna Slater Stainless, Inc. realized a number of benefits from the burner retrofit project. Because the TJSR v5 provides preheated combustion air without the need for expensive heat exchangers and related hot air piping, there was a significant savings in hardware and installation costs. TJSR v5 burners can light anywhere in the ignition range, so the cost of pilot piping was also eliminated. The most significant benefit was the energy savings achieved during furnace operation. Documentation showed the new TJSR v5 burners delivered a remarkable 42% reduction in fuel costs over the previous ambient air burners.



New TJSR v5 burners after conversion.



TJSR v5 burners combine a high velocity flame with fuel saving integral recuperation.