

## Application**brief**

**Eclipse Product:** AutoRecupe (SER version 3)

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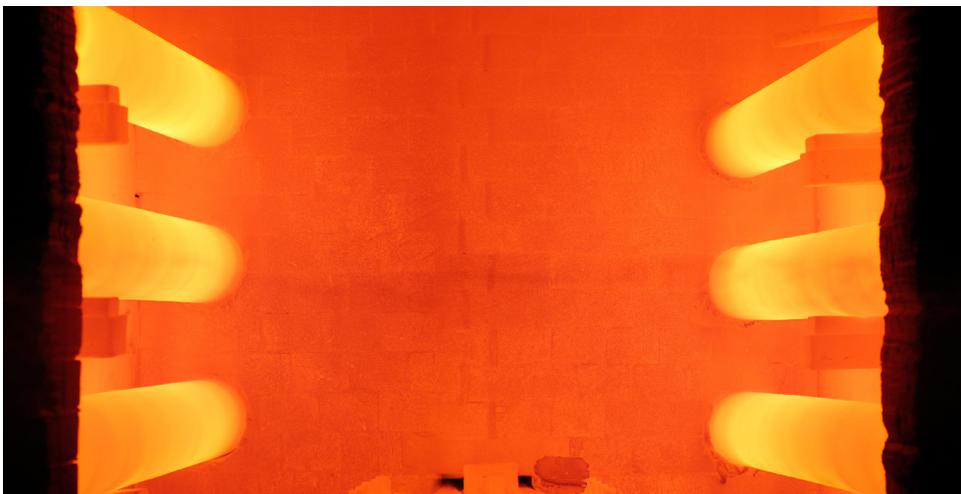
**Application:** Batch Process, Atmosphere, Heat Treating Furnace

**Description:** Rock River Heat Treat in Rockford, Illinois is a sister company of Hi-Temp Inc. and a subsidiary of Blue Water Thermal which owns 19 heat treating facilities in the United States and Canada. They are the second largest heat treater in North America.

In 1981 Rock River acquired an in-direct fired furnace and quench designed for 1750°F (950°C) operation. Original specifications called for a maximum fuel demand of 2400 cfh of 1000 Btu/cf natural gas at 2 psig maximum pressure and 18 oz. air.

The furnace had the original “Can” burners with Trident tubes and external recuperators. There were a total of four burners. The furnace was capable of processing a 1700 pound load in 1 hour and 40 minutes. Tube failures were becoming problematic and down time was excessive. Tube replacement or maintenance required the furnace to be off line for three days at a time (a day to cool, a day to repair and a day to restart).

They contacted Eclipse looking for possible solutions to remedy their maintenance and down-time issues without having to purchase a new furnace. Eclipse



*Furnace up to temperature showing all six single ended radiant tubes.*

recommended a furnace rebuild using AutoRecupe SER version 3 burners with ceramic inner and metallic outer tubes. Six burners were installed to allow the furnace to achieve maximum efficiency. By using SER burners, heat recovery takes place within the burner and furnace chamber, eliminating the need for external recuperators and insulated piping.

The furnace rebuild and burner start-up were accomplished without incident and required minimal down time. Much of the original combustion equipment (combustion air blower safety shut-off valves etc.) was still useable.

**Note: See page 2 for additional information**

After testing the system and monitoring fuel usage, it was found that efficiency was increased substantially. A 1700 pound load could now be processed in 1 hour and 10 minutes, saving 30 minutes per load, which depending on scheduling (demand), allowed for an increase of 2 to 3 extra loads per day. It was found that this increased production could be accomplished using the same amount of fuel that was previously required by the old system.

Walter Wear, plant maintenance manager said, "It's like getting the extra capacity free". He added, "After 1 year and 8 months we have had no maintenance problems or tube failures. I am delighted with that because I once had to personally crawl into that furnace to pull out the old trident tubes when they failed. We anticipate that if maintenance is required, it should take 45 minutes to remove the atmosphere, an hour to perform the work and an hour to reintroduce the atmosphere and we will be back up and running. That's three days down time reduced to about three hours".



*Back view of the furnace showing the location of the AutoRecupe burners.*



*Close up view of the Eclipse AutoRecupe Ultra SER burners*