

Is Your Heat Treat System Treating the Atmosphere Badly?

Hiring the experts will save you thousands in energy costs within a few years payback!

Project and Baseline



From Waste Heat to 7 million cubic feet of Natural Gas Savings

There was awareness that releasing 1700°F (925°C) of combustion product up a stack provided for significant heat recovery and energy savings opportunities. This Continuous Heat Treat operation line consisted of a Hardening and Draw Furnace that ran at high temperatures yet it did not implement any heat recovery technology.

Baseline:

A natural gas consumption baseline was developed to benchmark current operating efficiencies for the two furnaces. Energy saving strategies and priorities were determined through a systematic analysis of the existing equipment system. The framework which was used to identify energy saving opportunities was based on the following:

Heat Generation – Heat Containment/Transfer – Heat Recovery

Findings

Diagnosis:

- A case was made to capture the waste heat generated by the Hardening Furnace and use it to heat the Draw Furnace
- Control of Draw Furnace pressure was poor
- The energy evaluation study determined a potential yearly energy savings of over 7 million cubic feet of natural gas on the Continuous High Heat/Draw Furnace line
- Total energy savings identified by the audit was projected at approximately \$110,000 on an annualized basis



Heat Treating of Steel Products

Solutions Implemented:

- Firebridge provided the engineering, procurement, construction, and commissioning of a system to redirect 1700°F flue gases from the Hardening Furnace to the Draw Furnace
- Focus on improving energy efficiency without negatively affecting product quality or production demands
- Eliminate the need to dilute the exhaust with inside air, reducing the local exhaust by 1,700 SCFM
- Ductwork and fan sized to minimize the negative pressure in the High Heat Furnace
- Provided internally insulated ductwork to eliminate thermal expansion issues



Installation of High Heat Ducting

Improvements Achieved:

- ✓ Reduce fuel consumption by 31% on the Draw Furnace
- ✓ Successful installation and commissioning during plant summer shut-down
- ✓ Payback 1.8 years
- ✓ Improve the cold air leaking into the High Heat Furnace by sealing
- ✓ Reduce green house gas emissions in the same proportion as the fuel consumption

