



## TKE-HTT™

Thermal Kinetic Energizer-  
Heat Transfer Technology

# CASE STUDY: LADLE DRYER

### BACKGROUND

A large Midwest steel producer has a fleet of 20 ladles, 2 ladle dryers, and 11 ladle preheaters. Their ladles are lined with dolomitic barrels and mag-carbon slag lines. The ladle dryers are used to dry out ladles after new refractories have been installed. There were significant reliability issues with the combustion systems that resulted in downtime, improperly dried refractories, increased natural gas usage, increased emissions and increased maintenance costs.

### CUSTOMER GOALS

1. **Improve reliability** - eliminate downtime and reduce maintenance costs.
2. **Decrease dry out time** - provide more uniform temperatures in a shorter time without damaging the refractories. Eliminate the need to install a 3<sup>rd</sup> ladle dryer.
3. **Reduce natural gas consumption** - use the latest technology available to lower the cost of operation.
4. **Reduce emissions** - maintain consistent firing ratios and provide more complete combustion of volatiles to reduce visible smoke in the shop.

### PROJECT DESCRIPTION

Baseline data was generated using a data-logging natural gas flowmeter. Using this information, a 3.5 MMBtu TKE-HTT™ combustion system was specified to replace the existing 6 MMBtu burner and gas train. The gas train, combustion air fan, and control panel were mounted on a steel skid, and quick disconnects were provided to allow for faster installation.

### RESULTS

<u>System</u>	<u>Dry-out Time</u>	<u>Natural Gas Consumption</u>
6 MMBtu Conventional	18 hours 12 minutes	121.75 MCF
3.5 MMBtu TKE-HTT™	9 hours 34 minutes	36.16 MCF
<b>Reduction</b>	<b>47.5%</b>	<b>70.3%</b>

### CONCLUSIONS

**FRC Global Inc.** • P.O. Box 278, Montreal, QC, H3Z 2T2, Canada • [FRCglobal.com](http://FRCglobal.com)  
PHONE: 1-800-609-5711 • PHONE: 1-514-931-5711 • FAX: 1-514-931-8378



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All of the customer's goals were achieved. Based on the success of the first installation, the second ladle dryer was also retrofitted. Cutting the dry-out time has eliminated the need to install an additional dryer. The customer removed the old combustion systems and made the TKE-HTT™ systems permanent installations.