FRC Global

TKE-HTT™

Thermal Kinetic Energizer
Heat Transfer Technology

COMBUSTION SYSTEMS

REVOLUTIONIZE YOUR INDUSTRIAL HEATING WITH TKE-HTT™

Expert Teams.
Quality Products.
Global Networks.

Who We Are

FRC Global is a leader in the supply of refractories, electrodes, and high-temperature combustion systems.

Supplying the iron, steel, and non-ferrous metals industries for over three decades, our reputation has been built upon being problem solvers for our customers. We are constantly looking for new ways to maximize output, increase efficiency, and positively impact your bottom line.

Our commitment goes beyond providing premium raw materials; we are dedicated to offering unparalleled technical support from our team of seasoned engineers.

As a second-generation, family-owned and -operated American company, we are dedicated to shaping the future of our industry for generations to come.

Our Mission

We are dedicated to delivering innovative, efficient, and sustainable products and capabilities. We meet our customers everywhere by traveling across the globe to solve their complex and unique challenges. By showing up when others don't, we open new market spaces and bring the best of our expertise with a personal, small-company touch. We choose to have fun while deploying decades of expertise, bringing a fresh perspective to the metals industry.

More About Us

Background Information

FRC Global is a second generation family owned company with 35+ years of history.

Our Global Offices

FRC Global has offices, agents, or partners in 20 countries around the world.

- North America: United States and Canada
- South America: Colombia
- Asia: China

We provide quality engineered products and services for all your high temperature applications.

FRC Global facts

Our quality control employees thoroughly inspect shipments to ensure products are within specification and are properly packaged.

Our sales force and services are available in the following regions:

- North America
- Central America
- South America
- Europe
- Middle East

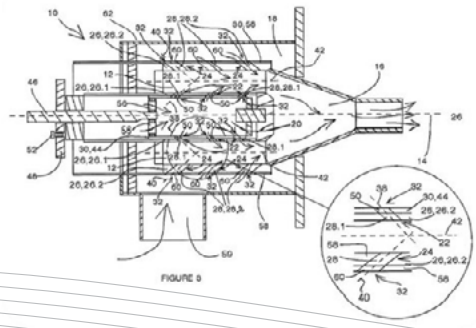
Co-owners of FRC Global
Sisters Leanne Pate, Julie Lord, and Dianne Detwiler

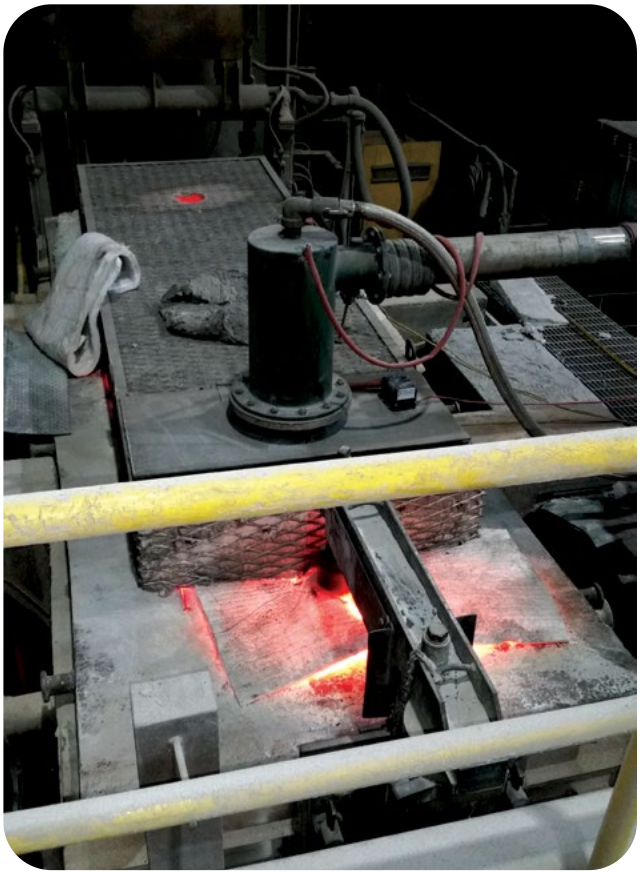
From left, Leanne (Director of People Operations), Julie (President and CEO), and Dianne (Director of Electrode Sales)

About TKE-HTT

With TKE-HTT™(Thermal Kinetic Energizer Heat Transfer Technology), FRC Global offers you a competitive advantage with a proven technology that will positively impact your bottom line with improved performance.

TKE-HTT™ is a patented, high-performance combustion system designed to replace traditional industrial gas burners. Created by inventor Carl Mörsner, this breakthrough in energy-efficient heating helps industrial operations advance green steel and decarbonization goals.





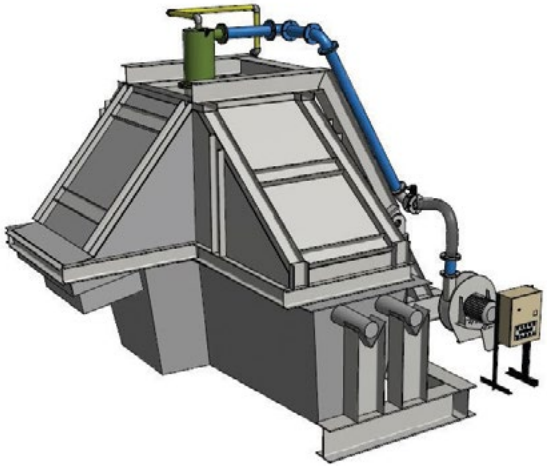
How It Works

TKE-HTT™

FRC Global represents the TKE-HTT™ Technology in North, Central and South America.

The TKE™ is a revolutionary system used in industrial heating to replace conventional gas burners. The TKE™ uses a small amount of natural gas to power a stream of molecules traveling at 220m/second resulting in the direct transfer of kinetic energy to heat. The energy transfer produces uniform heat within the vessel, work piece or heat exchange system while reducing the harmful emissions associated with a conventional burner system.

This proprietary technology applies to all industries using a direct-fired, forced-draft heating apparatus.

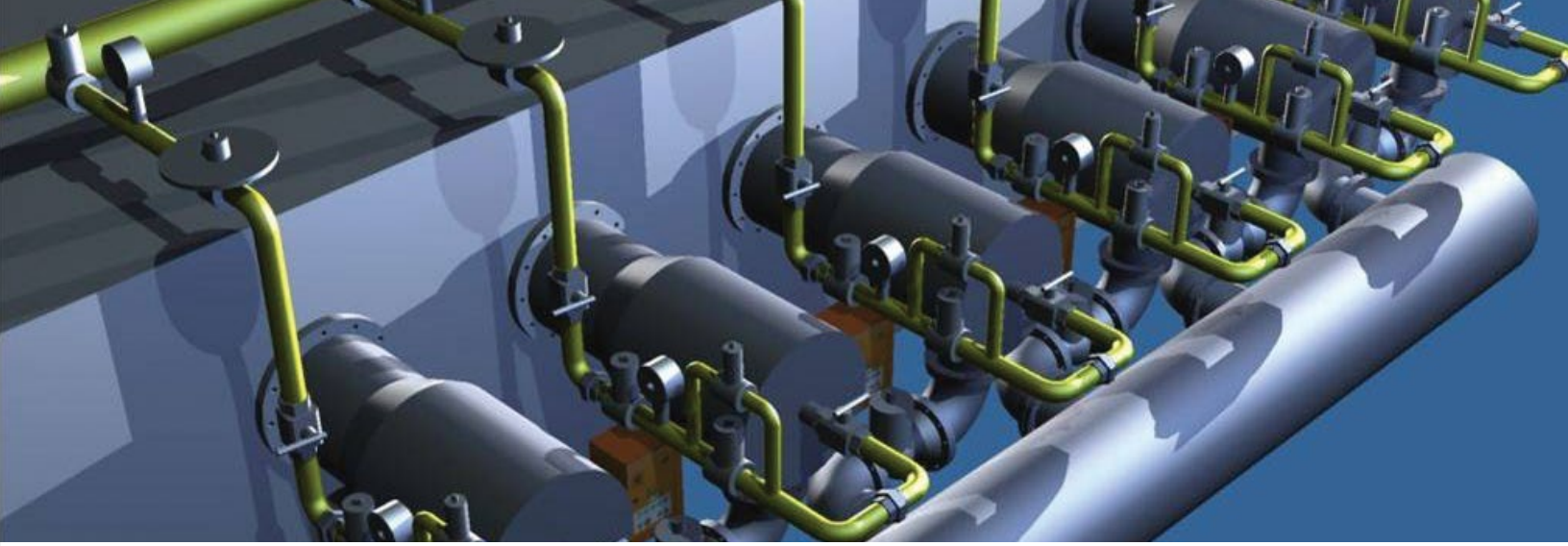


Features and Market Sector

Heating Apparatus	Direct Fire + Forced Draft /Max Temp 1350°C/2462°F
Pre-heaters/ Refractory Heating	Steel ladles
	Tundishes

Features

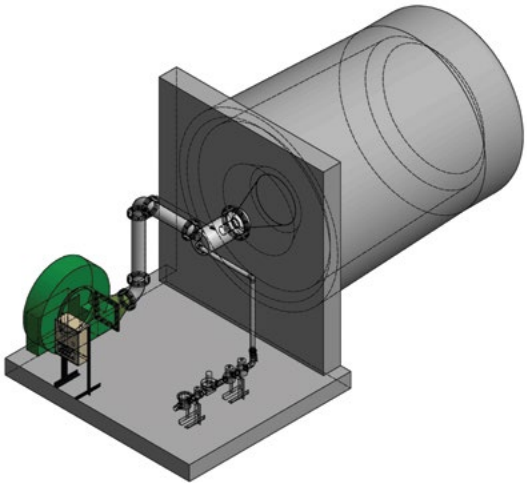
- The TKE™ system replaces traditional burners with little disruption in production during retrofit installations.
- System is designed for operation in most heating applications from 200°C (392°F) to 1350 °C (2462°F).
- A single TKE™ may replace multiple conventional burners.
- Natural gas and propane may be used as the energy source.
- Complete combustion within the TKE™ produces a focused stream of energy resulting in the heating of the work piece, charge, furnace, or oven.
- The complete combustion of fuel within the TKE™, and less fuel consumption creates less emissions.
- The system produces the same heating effect as conventional systems with greater uniformity and penetration.
- The TKE™ may be mounted in any position and at any angle in the furnace or preheater.
- No recuperated air is required as the system eliminates the need for that system entirely.
- The TKE™ operates using a low-pressure gas supply.
- The TKE™ requires less forced air supply volume due to the reduction in required gas flow, resulting in reduction in electricity.
- An easy to learn control system minimizes training and routine monitoring by operators.
- The control system requires virtually no routine maintenance.
- No moving parts within the TKE™ emitter unit.
- A single spark plug supplies the ignition.
- Full on/off pulse fire system operates at maximum efficiency.
- FRC Global controls, components, and system operation are engineered to meet NFPA 86 standards.

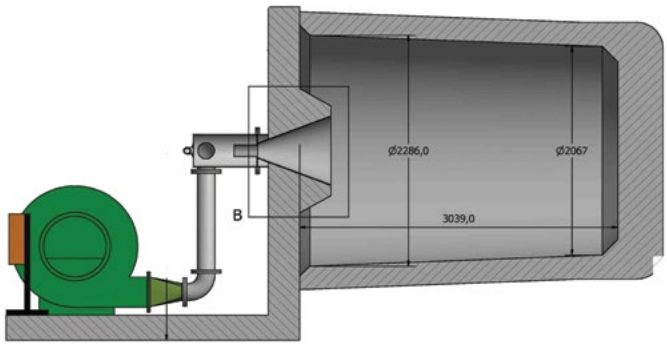


Benefits

Benefits of installing the TKE-HTT™

- A reduction in fuel consumption of 50% or greater.
- Overall reduction of emissions due to reduced fuel consumption.
- A reduction in heat processing times.
- Lower temperatures may yield the same results.
- Near Zero Delta T between environment and the vessel, charge or work piece.
- Temperature uniformity.
- Elimination of thermal stress, reducing cracking and deformation of the work piece.
- Faster ramp up time.
- An increase in heating system reliability





PUTTING TKE-HTT TO THE TEST

CASE STUDY:
LADLE PREHEATER

THE BACKGROUND

- Ladle Capacity – 130 ton
- Refractory Type – Dolomitic barrel and bottom with mag-carbon slag line
- Preheater Temperature Set-point – 1900°F
- Preheater Type – Horizontal with a natural gas/forced air burner
- Burner Rated Capacity – 12 MMBTU/hour

GOALS

1. **INCREASE RELIABILITY**
   Eliminate downtime, reduce maintenance costs.
2. **ELIMINATE HOT & COLD SPOTS**
   Provide more-uniform temperatures and drive more temperature into the bottom refractories.
3. **REDUCE NATURAL GAS CONSUMPTION**
   The existing burner frequently delivered erratic combustion, which resulted in overheating of the ladle refractories.

OUR PROJECT

Baseline data was generated using a data-logging natural gas flowmeter. A 3.5 MMBTu TKE-HTT™ combustion system was specified to replace the existing 12 MMBtu burner and gas train. The gas train, combustion blower, and control panel were provided on a steel skid, and the installation was complete in less than 24 hours.

RESULTS

System	Average Natural Gas Consumption
Conventional (12 MMBtu)	8195 MCF
TKE-HTT (3.5 MMBtu)	2409 MCF

With TKE-HTT, Decreased Natural Gas Consumption by **70.6%**

PUTTING TKE-HTT TO THE TEST

CASE STUDY:
LADLE DRYER

THE 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.

THE PROBLEM

Significant reliability issues with the combustion systems that resulted in downtime, improperly dried refractories, increased natural gas usage, increased emissions and increased maintenance costs.

GOALS

1. **IMPROVE RELIABILITY**
   Eliminate downtime, reduce maintenance costs.
2. **DECREASE DRY-OUT TIME**
   Provide more-uniform temperatures in a shorter time without damaging refractories. Eliminate need for third ladle dryer.
3. **REDUCE NATURAL GAS CONSUMPTION**
   Use the latest technology available to lower operation costs.
4. **REDUCE EMISSIONS**
   Maintain consistent firing ratios and provide more complete combustion of volatiles to reduce visible smoke in shop.

OUR PROJECT

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

System	Dry-Out Time	Natural Gas Consumption
Conventional (6 MMBtu)	18 hours, 12 minutes	121.75 MCF
TKE-HTT (3.5 MMBtu)	9 hours, 34 minutes	36.16 MCF

With TKE-HTT:
- Decreased Dry-Out Time by **47.5%**
- Decreased Natural Gas Consumption by **70.3%**

Why Should You Choose TKE-HTT?

Reduced Processing Times

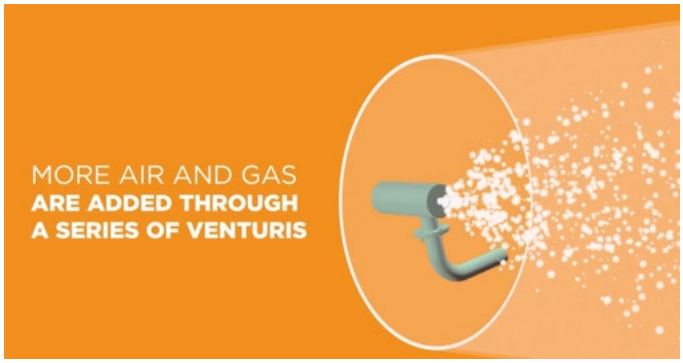
Decreased Pollution and Noise Levels

Maintenance Avoidance

Energy Bill Savings

SOUND TOO GOOD TO BE TRUE? HERE'S MORE ABOUT HOW IT WORKS

Ignites a small amount of gas and air



As the burning gases rapidly expand, more air and gas are added through a series of venturis

These conditions create a high-velocity energy stream that uses vibrational energy to achieve convective heating at a high rate

GIVE YOURSELF AN UNFAIR COMPETITIVE ADVANTAGE

If you need your facility to save on natural gas, time, and money, it turns out you're in good company. We just can't tell you who these people are because of their unfair competitive advantage with TKE-HTT.

She won't reveal her name or her company's name, but her results speak volumes. With TKE, her company's facility slashed natural gas use by up to 50%, drastically cutting CO2 emissions and moving the needle on corporate sustainability goals.

You can't see his face, but you can see the impact. TKE is helping him save up to $15,000 a month in fuel costs alone. When efficiency meets smart energy use, the financial results speak for themselves. Want in on his hidden truth?

He's in the shadows for a reason. With TKE, his team trims 30–40% off ladle prep time—boosting efficiency and maximizing uptime. Fast, repeatable, reliable. He's not giving up his edge... but you can learn some of the hidden truth.

Click here to read, watch, and learn more

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