



# GYRO-THERM™ BURNER



**The world's best gas-fired kiln burner.  
Used by the most globally competitive  
process plants.**

## Setting new global performance benchmarks with natural gas.

When natural gas is the primary fuel, the Gyro-Therm burner is proven to be the most efficient burner technology, with third party verification of lower operating costs and decreased Nitrogen Oxide (NOx) emissions. FCT Combustion's flagship natural gas kiln burner is endorsed by the USA EPA as the best-in-class natural gas burner technology. No other natural gas burner on the market can match it for optimizing kiln performance, raising productivity and minimizing emissions. The Gyro-Therm burner can be integrated with coal and alternative fuel capabilities to deliver the flexibility to rapidly switch fuels when needed.

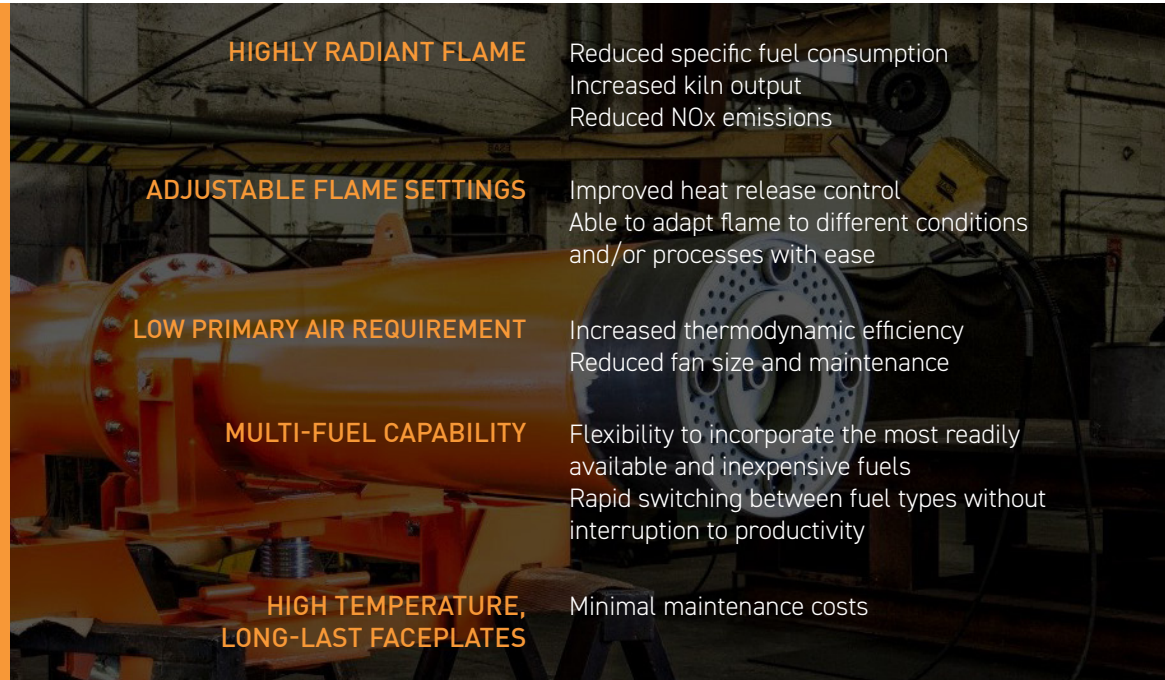
**REDUCED FUEL CONSUMPTION**

**LOWEST POSSIBLE NOx**

**FULLY ADJUSTABLE FLAME SHAPING**

**MULTI-FUEL CAPABILITY**

**LONG REFRACTORY LIFE**



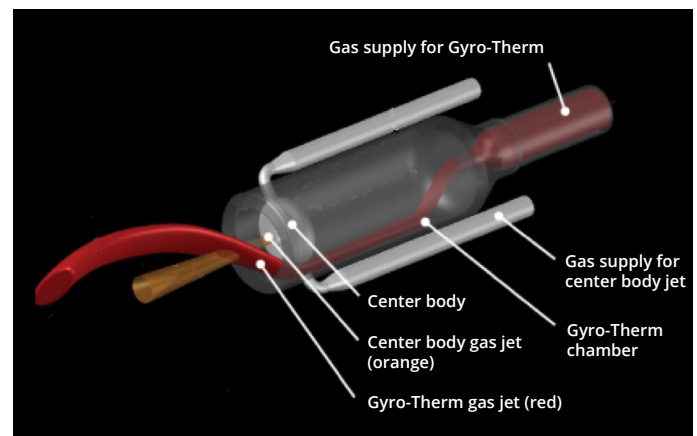
## Unique technology exclusive to FCT Combustion.

The Gyro-Therm burner is a unique burner technology developed and patented by FCT Combustion in conjunction with the University of Adelaide.

It has a distinctive geometry that creates a fuel jet leaving the burner in a gyroscopic-like precessing motion. This promotes rapid large-scale mixing of air and gas to produce fuel 'pockets' that burn under fuel-rich conditions, leading to a highly luminous flame, ensuring increased radiative heat transfer to the bed, decreased flame temperatures and lower NOx emissions.

The flame shape and heat flux profile from a Gyro-Therm burner can be easily shaped to optimally match each plant's particular requirements. It can also be adjusted at any time in response to changes in process or conditions. Two channels are used to shape the flame: an axial jet in the center of the Gyro-Therm burner and a co-annular axial gas channel. This also provides increased flame stability and turn down ratio.

Unlike other conventional burners, Gyro-Therm burner has no primary air requirement when using gas, although some is used for cooling, so thermodynamic efficiency is increased.



The Gyro-Therm burner consists of a unique chamber and center body. The geometry of the chamber causes the gas jet to exit at an angle and precess around the burner axis, producing unique mixing. A central gas jet from the center body is used for flame shaping, causing the gas to exit more axially and producing a narrower flame. A co-annular axial gas channel (not shown) is also used for extra flexibility in flame shaping.

See our precessing jet technology in action [Watch the video](#)





## Proven to optimize performance.

The Gyro-Therm burner is a proven burner technology with over 20 years of application in numerous rotary kiln applications. It is currently optimizing kiln processes across the globe in the cement, lime, iron ore, alumina and other mineral processing industries for some of the world's major companies, such as: Lafarge-Holcim, Vale, Ash Grove Cement Company/CRH, Heidelberg and Graymont.

<b>INDUSTRY APPLICATION</b>	Rotary kiln for all industries
<b>PRIMARY FUEL TYPE</b>	Natural gas
<b>MULTI-FUEL CAPABILITY</b>	In combination with solid, liquid and alternative fuels.
<b>OUTPUT</b>	Customizable up to 150MW High turn down, no warm up burner required
<b>PRIMARY AIR DATA</b>	5% with gas; approximately 7% with coal
<b>INCLUDES</b>	Full flame shape control by multiple gas channels Optional ceramic coating of faceplates for increased protection
<b>ACCESSORIES</b>	Integral automatic pilot ignitor In-burner flame sensor

"FCT Combustion is our approved international burner supplier. Their Gyro-Therm technology means NO<sub>x</sub> is always well within regulations, the kiln refractory is not-overheated and there are no damages, thermal shocks or clinker build-up."

**JULIAN FRANCISQUETO,  
VALE**

## The most radiant gas burner on the market.

The unique mixing of the Gyro-Therm burner produces the most radiant natural gas flame for increased heat transfer compared to conventional burners. The improved flame shape and heat transfer profile also delivers enhanced product quality and quantity.

Additionally, the Gyro-Therm burner is proven to reduce plant running and maintenance costs as it:

- Increases refractory lifetime
- Reduces the tendency for ring formation
- Saves on the ID fan with less combustion products generated
- Reduces electrical consumption of the primary air fan (<5%PA at <5kPa)
- Greatly reduces primary air volume for gas firing.

Typical production figures\* demonstrate the Gyro-Therm burner's benefits as it:

- Reduces specific fuel consumption by up to 5.7%
- Increases kiln output by up to 11%
- Reduces stack NO<sub>x</sub> emissions by up to 37%.

\*For cement production, producing clinker type II.

"For over 20 years, we have enjoyed a valuable relationship with FCT Combustion. They continually demonstrate world class excellence with combustion technologies, process engineering and how to optimize plant output. Our mission to remain the largest American owned cement producer and contribute to industry leading sustainability practices is made easier, thanks to their talented process engineers and combustion products."

**MIKE HRIZUK, ASH GROVE CEMENT COMPANY**



Case studies can be downloaded from our website [Visit now](#)





## **Setting global performance benchmarks in pyro-processing.**

FCT Combustion is the world leader in optimizing high-temperature processing plants to realize new levels of performance for productivity, emission control, fuel efficiency and flexibility to meet ever-changing requirements.

Our pyro-processing products and expertise are all based on proven and scientifically validated techniques, helping our global customers be competitive as their needs and industry conditions change. Our designs, engineering and product range are used in the world's most competitive mineral processing plants.

## **GYRO-THERM BURNER**

### **Unlock the performance of your process plant.**

What would a 5% improvement in productivity mean for your plant? Along with total control over NOx emissions and product quality? Contact us to utilize our global pyro-processing expertise and the world's leading gas fired burner to get more from your plant.

**VISIT [FCTCOMBUSTION.COM](https://www.fctinternational.com)**

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