

# ETHYLENE

Best Available Technology

Burners | Flares | Thermal Oxidizers

BURNERS | FLARES | THERMAL OXIDIZERS  
VAPOR CONTROL | RENTALS | AFTERMARKET



# ETHYLENE

## Burners

ZEECO GLSF Enhanced Jet  
Flat Flame Burners



### Ethylene applications burners.

#### Lower Your Investment, Raise Your Expectations

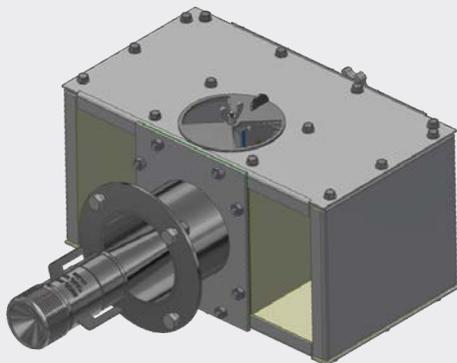
Our focus on the whole combustion process is what makes Zeeco a leader in retrofitting or equipping ethylene cracking furnaces with the latest low, ultra-low, and next generation emissions burner technology. Zeeco utilizes its patented FREE JET™ mixing technology for internal flue gas recirculation (IFGR), providing the lowest NO<sub>x</sub> emissions available. ZEECO® burners are designed for compact spaces; reliable, safe, and stable operation; with no flame rollover; without flame interaction between burners; and with high turndown. With hundreds of successful ethylene cracking furnace installations, we have the experience and the technology to meet your application challenges.

#### Typical Olefins Burner Applications

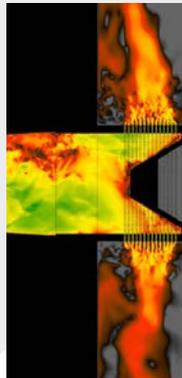
- Retrofitting or equipping ethylene cracking furnaces with ultra-low emissions burner technology

#### ZEECO (RWSF) Radiant Wall Burner

- Premixed/Staged Fuel Ultra-Low Emissions Radiant Wall Burner
- Predicted NO<sub>x</sub> emissions as low as 18 ppmv
- Reduces flashback and emissions by proprietary gas tip design
- Optional ZEECOLITE™ lightweight tile
- 304 stainless steel spun venturi/mixer
- 310 stainless steel (cast equivalent) gas tip
- Redesigned fuel staging
- Horizontal slots designed to minimize flashback

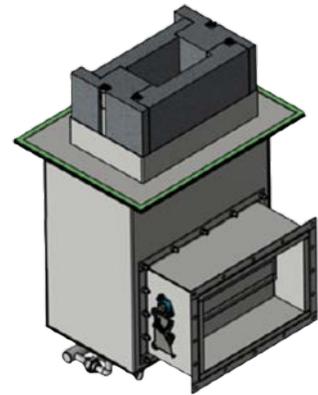


Horizontal Slot Radiant Wall Burner



#### ZEECO GLSF Enhanced Jet Flat Flame Hearth Burner

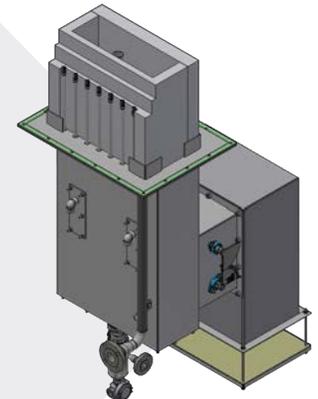
- Flat flame burner utilizes internal flue gas recirculation (IFGR) technology
- Predicted NO<sub>x</sub> emissions as low as 35 ppmv
- High turndown of 15:1 or greater for most cases
- No stabilization metal used in burner throat
- Low maintenance cost due to prolonged life design of burner tile and tips



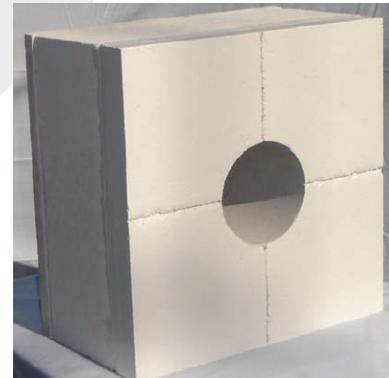
ZEECO GLSF Enhanced JET  
Flat Flame Hearth Burner

#### ZEECO GLSF FREE JET Hearth Burner

- Flat or round flame burner utilizes IFGR
- High turndown of 10:1 or greater for most cases
- Predicted NO<sub>x</sub> emissions as low as 15 ppmv
- No stabilization metal used in the burner throat
- Prolonged life and low maintenance of burner tile and tips



ZEECO GLSF FREE JET  
Hearth Burner



ZEECOLITE™ Burner Tile for Radiant  
Wall Burners

# ETHYLENE APPLICATIONS

From the wellhead to chemical and petrochemical facilities worldwide, Zeeco has more than three decades of combustion experience, including the most challenging and innovative burner, flare, and thermal oxidizer projects in the world. Because Zeeco is a combustion company and not solely a flare or burner company, we take a more complete view of plant processes and interactions.

## Big claims backed by solid research.

Zeeco's expert engineering group goes the extra mile with every combustion solution we design and our standard approach is anything but "standard." We use advanced Computational Fluid Dynamics (CFD) to model your specific process conditions against actual equipment design, allowing us to accurately simulate flame behavior and interaction under varying firing conditions, fuel types, and flows. The result? Combustion solutions with reliable, superior results and a system that lasts significantly longer.

The same commitment to excellence applies to our complete combustion testing process. Our Combustion Research and Test Facility, one of the largest in the industry, was the first in the world to become ISO 9001-2000 certified, and our staff stays ahead of rapidly changing regulations and emission requirements. Zeeco's Test Facility is equipped with two furnaces with 40-foot coils and multiple burner firing capacity to accurately simulate real world cracking furnace applications. With our flare testing facilities and multi-fuel capabilities, from natural gas to butadiene, and more, Zeeco can simulate flare system performance in a variety of conditions.

## Aftermarket service.

Whether you need replacement flare tips, gas tips, ignition systems, or pilot parts for Zeeco equipment or other manufacturers, Zeeco's parts and service team is ready to help. When you call, you talk to an experienced combustion expert. From quick turnarounds for quotes and fast shipping for parts to top-notch diagnostics and service, we're there when you need us, worldwide. We understand how proper training for operators prolongs the life of your olefins equipment, reduces long-term maintenance costs and protects the safety of employees.



# ETHYLENE

## Flares

ZEECO HCL Steam  
Assisted Flare Tip



### Ethylene applications flares.

#### A Flare for Every Design

Simply put, every ZEECO® flare is engineered to meet your plant's safety, reliability, and environmental requirements. We understand the complex interaction of flame, fuel, emissions, and public perception in ethylene production and olefins plants. Zeeco's flare systems for olefins production are designed to operate smokelessly at significant flow rates for long periods of time. If your plant is near a population center, environmentally sensitive area, or if your space is limited, our experienced flare team will design a fully enclosed ground or multi-point ground flare system to eliminate visible flaring and reduce environmental impacts without compromising efficiency, safety, or reliability. For facilities with existing flare stacks, our HCLSX Steam Assisted Flare tip can be easily retrofitted for high efficiency, low noise performance.

From the ground up, plant operators around the world trust Zeeco flares to reliably protect facilities, employees, reputations, and the environment.

#### Typical Olefins Flare Applications

- Smokeless flaring for ethylene, propylene, butadiene plants
- For plants in densely populated, residential, or environmentally sensitive areas

#### Multi-Point Ground Flare

- Very high smokeless capacity
- Long flare life; minimized utility requirements
- Lower maintenance cost from investment cast burner heads
- High turndown
- Steam/Air Assist options available for low pressure situations



ZEECO RWSF 3-D Model

#### Totally Enclosed Ground Flare

- Smokeless flaring technology
- Long flare life
- Lower maintenance cost from investment cast burner heads
- High turndown
- Locations requiring reduced environmental impact

#### Steam Assisted Flare

- High efficiency, low noise smokeless performance
- High stability, low fuel consumption pilots are standard
- 98.5% or higher destruction efficiency
- Superior materials and construction features

#### Air Assisted Flare

- Very low operating costs for smokeless operation
- Lower radiation level at grade due to high aerated flame
- 98.5% or higher hydrocarbon destruction efficiency
- High stability pilots



ZEECO RWSF 3-D Model

# ETHYLENE

## Thermal Oxidizers

### Ethylene application thermal oxidizers.

#### Cost Effective Solutions for any Waste Stream

ZEECO® Thermal Oxidizers offer a robust design with high destruction efficiency to destroy hydrocarbons in the waste and vent streams associated with ethylene production. Our custom designs can accommodate a wide variety of waste streams. Multiple waste streams can be combined in a single thermal oxidizer unit to achieve the most cost effective solution. Options for heat recovery are available in our thermal oxidizer packages to increase plant efficiency. In addition, our thermal oxidizer division can supply direct fired air heaters for polypropylene production or other processes that require heat input for start-up or reactor regeneration.

#### Typical Olefins Thermal Oxidizer Applications

- Destruction of tank vapors/process vent streams
- Destruction of vent streams from spent caustic treatment systems/wet air oxidation
- Direct fired air heaters for polypropylene plants

#### Direct Fired Air Heater

Zeeco's Direct Fired Air Heaters are used during the reactor regeneration process in the production of propylene. These heaters provide a constant source of heat input to the reactor beds at high air flow rates. Our systems are available in a wide range of heat releases depending on the size and configuration of the process.

Zeeco's proprietary burner design offers stable combustion across a wide variety of flow rates and fuel compositions, including high hydrogen fuels.

#### Combustion Experts

Our combustion experts design and deliver specifically engineered applications with the best available technologies, utilizing the most modern CFD and complete physical testing capabilities for olefins plants on time, on budget, and with guaranteed performance. Choose a combustion company who understands your daily operating conditions and how the right equipment can solve challenges, save money, and keep your olefin plant and your people safe day after day.



*ZEECO Vertical Tank Vapor Thermal Oxidizer*



*ZEECO Direct Fired Air Heater*



## The Zeeco Difference

By concentrating on what we do best, Zeeco has grown into a worldwide leader in combustion and environmental solutions. We are a privately held company whose ownership stays highly involved in daily operations, with upper management comprised of the world's leading combustion experts.

When you call Zeeco, we answer. When you make a request, you get a quick, efficient response. We are lean and efficient, able to make decisions quickly, without bureaucracy and red tape. Our sales, engineering, and purchasing groups work hand-in-hand to deliver highly competitive quotes and heroic turnaround times. We stand ready and willing to travel anywhere in the world to discuss upcoming projects firsthand, and to ensure that every existing project runs seamlessly.



Visit [zeeco.com/contact](https://zeeco.com/contact) for additional Global Location contact information



Choose to work with our dedicated, flexible, and innovative team, and you won't be disappointed. Call or email us today to request a quote or to learn more about our proprietary combustion systems.

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REGISTERED  
ISO 9001:2015

Certification applies to  
Zeeco Headquarters.