

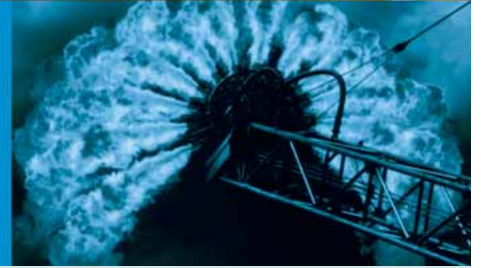


SMOKELESS, ENERGY-EFFICIENT,  
LOW-RADIATION SOLUTIONS

CLEAN COMBUSTION. CLEAR SOLUTIONS.™



# PRODUCTION FLARES





John Zink Company, LLC, develops advanced pollution-control systems, fired equipment and next-generation technologies that serve industries across the globe. Our flares, process burners, duct and boiler burners, thermal

oxidizers, flare gas recovery and vapor control units are the most sophisticated, reliable systems in the world, helping businesses operate cleaner and more efficiently.



*The strength of our JZ® and KALDAIR® product lines firmly establishes John Zink Company as a world leader in advanced flare systems for oil and gas industries.*

# A NEW ERA IN CLEAN FLARING

John Zink Company understands the environmental hurdles and economic concerns facing production operations. That's why we've pioneered the world's most advanced flaring systems to help oil and gas producers minimize the environmental effects of flaring – and do it economically.

We call this advancement *clean flaring* for the technologies that power the two most recognized brands in flare systems – JZ® and KALDAIR®.

John Zink's flares set a new standard for clean, economical combustion by minimizing or eliminating smoke, radiation, noise, bright light, and other flaring effects that impact your business. Our flare experts engineer these systems from the operator's point of view, with a focus on safety, ease of operation, and proven performance. Because they're from John Zink Company, JZ and KALDAIR flares, accessories and replacement parts are designed to operate in the toughest environments, under the most severe conditions.

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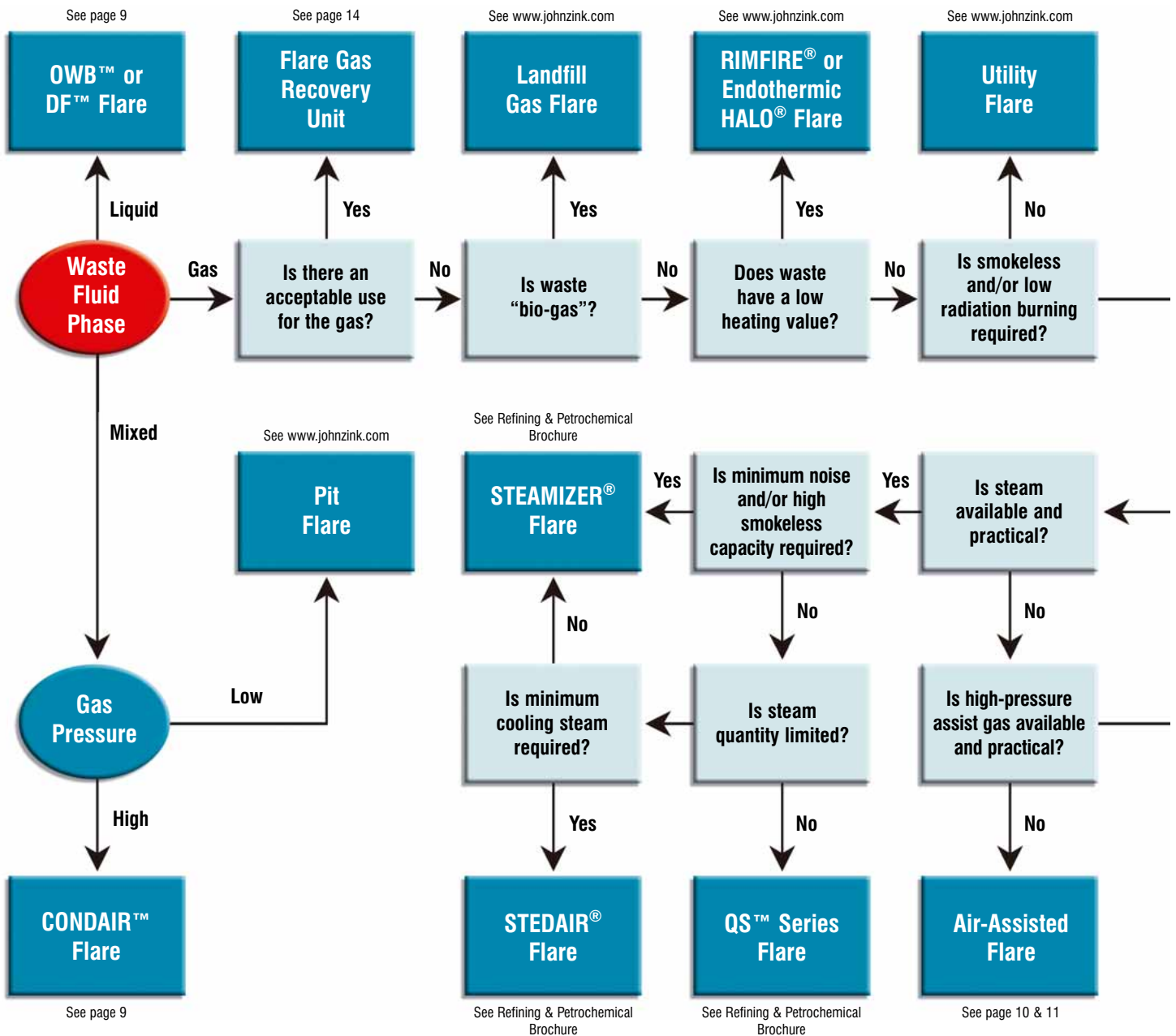




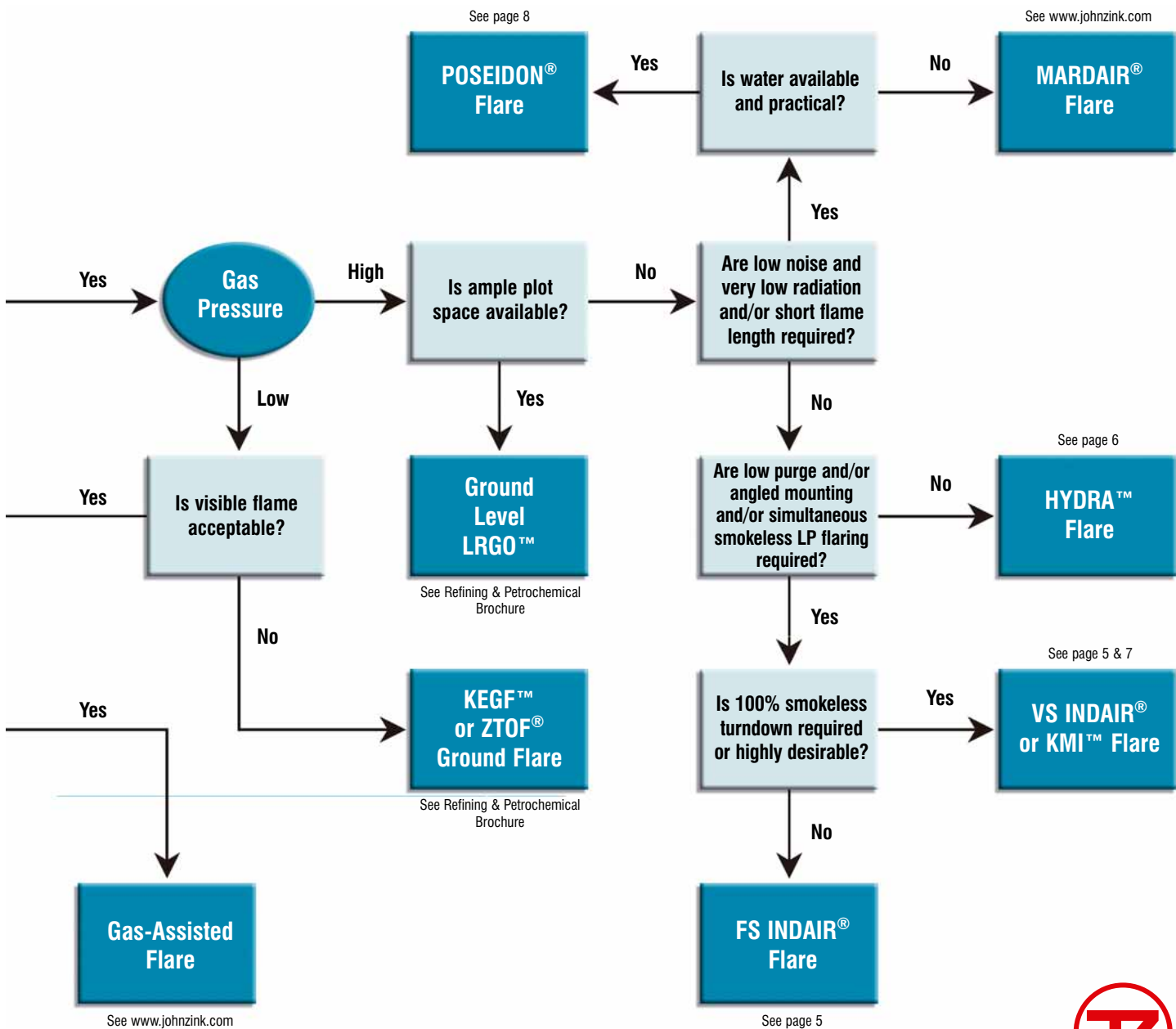
# COMPREHENSIVE FLARE SOLUTIONS

Selecting a flare system with the features and technology most qualified to meet the demands of your application doesn't have to be

a challenge. The following guide will help you identify the flare best suited to achieve your environmental and economic goals.









# HIGH-PRESSURE FLARES

## HIGH PERFORMANCE. LOW RADIATION. LONG TIP LIFE.

The KALDAIR INDAIR, JZ HYDRA, KALDAIR MULTIPOINT INDAIR (KMI) and JZ POSEIDON flare systems provide low radiation, quiet operation and unlimited turndown – making them the production industry’s most economical high-pressure flare choice. These environmentally friendly flare designs produce short, smokeless flames with no assist medium, allowing use of shorter boom lengths

and simpler mounting structures. Our high-pressure flares incorporate rugged designs to withstand the harsh operating environments required for many offshore flares. John Zink’s high-pressure flare systems safely deliver the highest smokeless capacities and lowest radiation of any high-pressure flare design.

## HIGH-PRESSURE TECHNOLOGIES

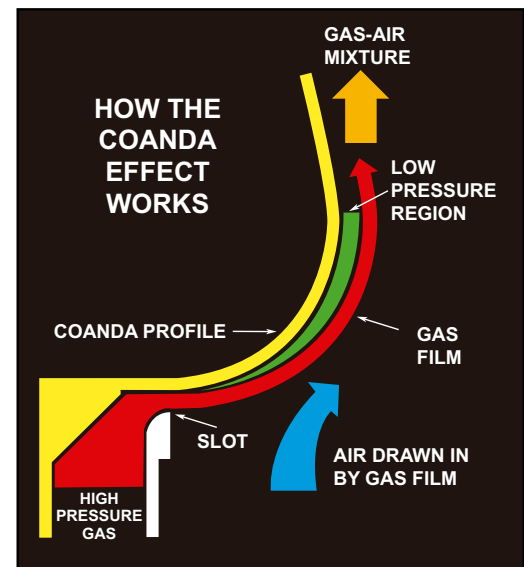
John Zink’s advanced high-pressure flares use Coanda and multipoint sonic flare technologies to reduce noise and radiation, permitting up to 70% shorter boom lengths on offshore facilities.

Coanda flares discharge high-pressure gases radially from an annular slot at the base of a tulip-shaped Coanda profile for stable yet turbulent smokeless flames.

John Zink Company’s multipoint sonic flare technology reduces low-pressure zones and burnback inside the flare to extend flare tip life. The high-pressure nozzles create a sonic gas flow that increases air aspiration and greatly decreases the radiation from the flame. Water-injection technology further improves the performance of our high-pressure flares, providing ultra low-NOx performance with low noise and radiation levels at or near turndown conditions.

Our KMI flare system combines the variable-slot Coanda technology with our rugged, multipoint sonic flare tip technology to reduce flame pull-down and improve smokeless operation.

For more information about our clean-flare technologies, see page 12.



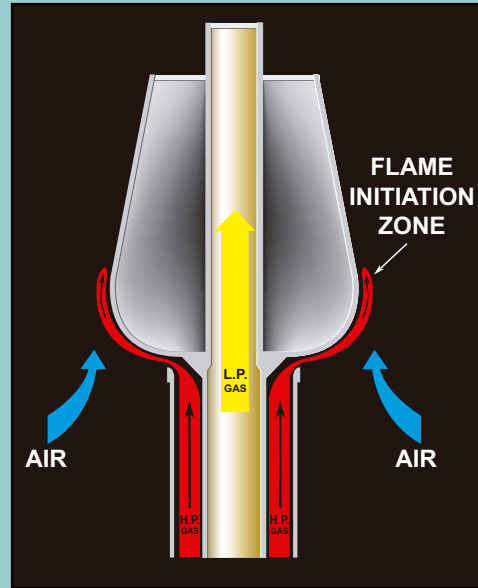
*John Zink’s water injection technology produces the lowest radiation and noise levels of any high-pressure flare.*

# INDAIR®

Backed by more than 400 successful installations worldwide, the INDAIR flare delivers 100% smokeless turndown and low radiation in high-pressure applications.

The INDAIR flare was engineered to incorporate the benefits of Coanda technology in a high-capacity flare design. Its innovative design burns gas flows from as low as purge levels to over 2,000 MMSCFD. Operating on both high and low pressure gas, the INDAIR flare provides low heat radiation and smoke-free combustion to offshore operations. The field-proven INDAIR flares create high gas velocities that efficiently, safely and completely atomize liquids without burning rain.

The INDAIR flare is available in either a fixed slot design, which exhibits hydraulics nearly identical to a multipoint sonic flare, or a variable slot design, which modifies the hydraulics to produce nearly 100% turndown capability. Its low radiation characteristics enable engineers to reduce the height and weight requirements of support structures for immediate cost savings.



*The INDAIR high-pressure flare is one of the oil and gas industry's most in-demand flare systems. The INDAIR flares can be provided in a combination HP/LP configuration.*



*INDAIR flare tip flaring 600 MMSCFD of gas with heavy liquid carryover.*

FEATURES	BENEFITS
<ul style="list-style-type: none"> <li>• Low heat radiation</li> </ul>	<ul style="list-style-type: none"> <li>• Shorter boom length or stack height required to meet radiation requirements</li> </ul>
<ul style="list-style-type: none"> <li>• Smokeless operation</li> <li>• High combustion efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced air emissions</li> </ul>
<ul style="list-style-type: none"> <li>• Variable slot design provides infinite turndown</li> </ul>	<ul style="list-style-type: none"> <li>• 100% smokeless operation without expensive staging systems</li> </ul>
<ul style="list-style-type: none"> <li>• Available in combination HP/LP configuration</li> </ul>	<ul style="list-style-type: none"> <li>• Provides simultaneous smokeless, low-radiation flaring of low pressure gases</li> </ul>

*The unique high capacity variable slot INDAIR flare tip provides 100% smokeless flaring over the entire range of operation.*





## HYDRA™

The HYDRA high-performance, sonic flare uses multipoint technology to create low-radiation, smokeless combustion over a wide operating range.

The HYDRA flare's array of small-diameter arms separates the flow of flare gas to individual, aerodynamic nozzles. Each convergent jet nozzle discharges gas at a sonic velocity that increases air aspiration while decreasing radiation from the flame. The long-lasting nozzles work with John Zink's patented high-pressure burner technology to create a short, stiff, stable flame that ignites above the metal tip and resists pulldown from high winds.

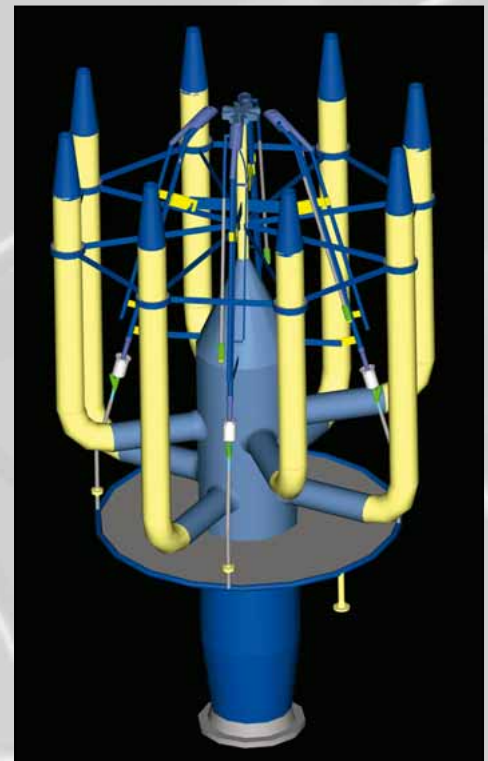
The HYDRA flare system handles light-to-medium weight, saturated hydrocarbons with pressures ranging up to 200 psig and capacities over 3000 MMSCFD. The HYDRA flare can also be configured to accommodate dual-stream, high-pressure and low-pressure flaring conditions.

### FEATURES

- Low heat radiation
- Smokeless operation
- Flame is ignited above the tip and resists pulldown in high winds
- Unique burner design provides stable flame shape
- Reliable ignition

### BENEFITS

- Shorter boom length or stack height required to meet radiation requirements
- Reduced air emissions
- Long flare tip life
- Safe flaring operation under all operating conditions



*HYDRA high-performance sonic flare tip creates short, highly directional, low-radiation flames, making the HYDRA flare ideal for offshore platforms, FPSOs and other areas with limited space.*



# KALDAIR MULTIPOINT INDAIR™ (KMI™)

Our KALDAIR MULTIPOINT INDAIR (KMI) flare system combines the INDAIR flare's variable-slot Coanda technology with the HYDRA flare's rugged, multipoint sonic flare tip technology to reduce flame pulldown and improve smokeless operation.

The KMI flare's Coanda technology entrains and pre-mixes large quantities of air into the flame to create low-radiation, smokeless operation. The variable-slot design provides infinite smokeless turndown and high capacities without the need for an elaborate, staged, multi-flare design. The variable-slot design also prevents harmful flame lick between adjacent nozzles and greatly reduces the purge gas rate required to prevent internal burning.

The KMI flare's small-diameter, tulip-shaped nozzles are fabricated from thick stainless steel castings and mounted on a multi-armed, common flare manifold. The result is extra long tip life.

FEATURES	BENEFITS
<ul style="list-style-type: none"> <li>Variable slot design provides infinite turndown</li> </ul>	<ul style="list-style-type: none"> <li>100% smokeless operation without expensive staging systems</li> </ul>
<ul style="list-style-type: none"> <li>No flame lick at low gas flow rates</li> </ul>	<ul style="list-style-type: none"> <li>Long flare tip life</li> </ul>
<ul style="list-style-type: none"> <li>Rugged cast stainless steel Coanda nozzles</li> </ul>	
<ul style="list-style-type: none"> <li>Ideal for angled boom mounting</li> </ul>	<ul style="list-style-type: none"> <li>Shorter boom length required to meet radiation requirements</li> </ul>
<ul style="list-style-type: none"> <li>Low purge gas requirements</li> </ul>	<ul style="list-style-type: none"> <li>Reduced operating cost (energy cost)</li> </ul>
<ul style="list-style-type: none"> <li>Reliable ignition</li> </ul>	<ul style="list-style-type: none"> <li>Safe flaring operation</li> </ul>
<ul style="list-style-type: none"> <li>High liquid handling capability</li> </ul>	<ul style="list-style-type: none"> <li>Prevents dangerous flaming rain</li> </ul>
<ul style="list-style-type: none"> <li>Multi-stage design provides high turndown without the need for staging valves</li> </ul>	<ul style="list-style-type: none"> <li>Reduced equipment and maintenance costs</li> </ul>



1st Stage



2nd Stage

*The multi-arm variable slot KMI flare tip allows multiple setpoints to be used on the spring-loading mechanisms. This provides a two-stage HP flare design without the use of staging valves.*



*The KMI flare combines the rugged multi-arm design of the HYDRA flare tip with the high turndown smokeless operation of the variable slot INDAIR flare tip.*



*The KMI flare's high-tolerance fabrication ensures the flames remain thin, stiff and pencil-shaped under all flow and crosswind conditions.*





# POSEIDON®

John Zink Company modified the HYDRA flare system with its proprietary high-pressure water injection technology to develop the POSEIDON flare. The smokeless, water-injected POSEIDON flare tip significantly reduces radiation and noise while delivering long tip life.

The POSEIDON flare's modular design reduces structural requirements to new facilities and modifications to existing structures.

The long-lasting, water-injected, sonic flare tip allows for safe radiation levels at increased production rates at minimal cost.

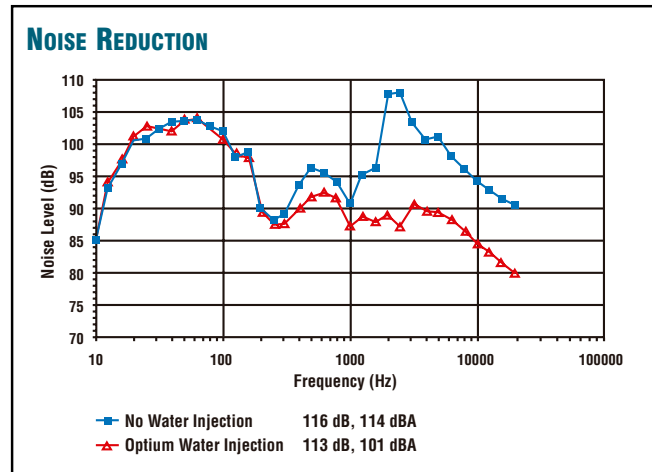
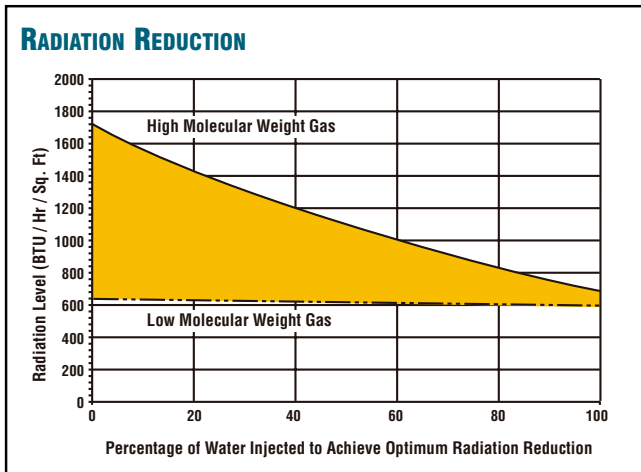
The POSEIDON flare can be retrofitted using a helicopter or portable lifting equipment.

## FEATURES

- Ultra-low radiation flaring
- Significantly reduced shock-associated noise
- Reduced flame temperatures
- Flame is ignited above the tip and resists pulldown in high winds
- Can be retrofitted on existing booms to reduce flare radiation without extending boom length

## BENEFITS

- Shorter boom length or stack height required to meet radiation requirements
- Safer and more tolerable operation of high pressure flare
- Long flare tip life
- Can allow increased oil/gas production rates with safe radiation levels



POSEIDON flare with water injection.



POSEIDON flare without water injection.

The POSEIDON flare uses proprietary water injection technology to significantly reduce the fraction of heat radiated from high-pressure flares. In some cases the reduction in radiation can be as high as 50%. Also, a noise reduction as high as 13 dBA can be achieved with the water injection.

# LIQUID FLARES

## PORTABLE DESIGN. FLEXIBLE OPERATION. EASY TO DEPLOY.

John Zink Company pioneered the logical alternative to remote oil disposal with its portable JZ OWB and KALDAIR CONDAIR liquid flare systems. The liquid flares eliminate the logistical headaches of shipping, trucking and storage, especially in hard-to-access locations on land, water and in arctic environments. We also developed our liquid flares with the clean-flaring advantages our customers expect, including minimum smoke, low radiation and low noise, and unique features for handling a wide variety of viscous fluids at high rates. Designs frequently include multiple flares on booms and use a water screen to minimize radiation during high flare rates.

### OWB™

The portable OWB liquid flare uses clean-burning technology to combust large volumes of viscous oils and oil-water mixtures in remote locations. Each flare tip fires an independent flame pattern to achieve maximum penetration of combustion air and contains a separate propane pilot to ensure ignition. The result is minimum smoke, low thermal radiation and low noise.

FEATURES	BENEFITS
<ul style="list-style-type: none"> <li>Provides clean, efficient combustion of large volumes of oil</li> </ul>	<ul style="list-style-type: none"> <li>Environmentally acceptable disposal of crude oil</li> </ul>
<ul style="list-style-type: none"> <li>Low smoke, radiation and noise</li> </ul>	<ul style="list-style-type: none"> <li>Reduced air emissions and safer operation when flaring liquids</li> </ul>
<ul style="list-style-type: none"> <li>Portable and flexible design</li> </ul>	<ul style="list-style-type: none"> <li>Easy and inexpensive to deploy</li> </ul>

For maximum penetration of combustion air, OWB flare tips are oriented to fire perpendicular to wind direction.



### CONDAIR™ PATENTED\*

The CONDAIR liquid flare system uses a Coanda-based flare tip to produce a pre-mixed air and atomized liquid/gas mixture for maximum combustion and outstanding clean-flaring. As a result, the CONDAIR flare tip burns up to 75% liquids without any fallout, burning rain or smoke production.

FEATURES	BENEFITS
<ul style="list-style-type: none"> <li>Smokeless flaring of liquids without additional atomizing medium</li> </ul>	<ul style="list-style-type: none"> <li>Decreased equipment costs, operating costs and maintenance costs</li> </ul>
<ul style="list-style-type: none"> <li>Low radiation</li> <li>Short, highly directional flames are ideal for shielding with water screen</li> </ul>	<ul style="list-style-type: none"> <li>Shorter boom length required to meet radiation requirements</li> </ul>
<ul style="list-style-type: none"> <li>High turndown design</li> </ul>	<ul style="list-style-type: none"> <li>High operational flexibility</li> </ul>



The CONDAIR flare's stiff, pencil-shaped flame resists wind influence, so the booms can be pointed away from the platform.

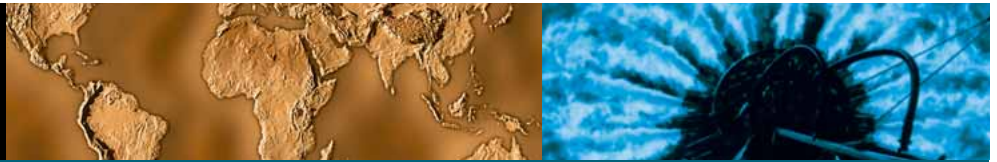


The CONDAIR flare is the ideal flare burner for mixed phase flaring in drilling, well testing and oil and gas production applications.



The CONDAIR flare atomizes and burns liquids without the need for atomization air or water.





# AIR-ASSISTED FLARES

## ENERGY-EFFICIENT. LOW NOISE. LONG SERVICE LIFE.

Oil and gas operators worldwide use John Zink's state-of-the-art air-assisted flare systems for energy efficiency, low maintenance and high performance in tough environments. For low-pressure requirements, the JZ LHLB, JZ LH and KALDAIR AZDAIR air-assisted flare systems deliver smokeless performance with less radiation and noise.

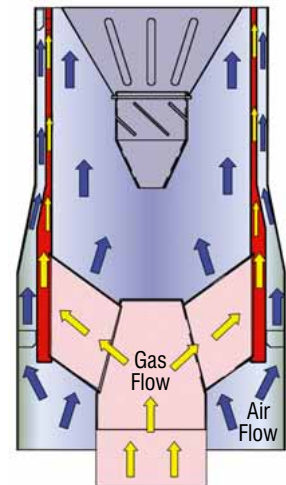
These long-lasting flares use a range of mixing head designs to optimize air-to-gas mixing. Any one of John Zink's air-assisted flares is an excellent first-stage flare for use in multi-flare arrays designed to meet higher capacity needs. And, each air-assisted flare employs John Zink's proprietary Flame Similarity Method to accurately predict smokeless performance and conserve air consumption. For more information about our clean-flare technologies, see page 12.

### LHLB™ PATENTED\*

The smokeless LHLB air-assisted flare system extends flare tip life while it minimizes the cost to dispose of difficult-to-burn gases. The LHLB flare's annular swirl design mitigates the internal burning associated with the operation of large air-assisted flares at turndown while providing complete ignition of waste gases at high exit velocities. The low-maintenance, simple tip design has no moving parts, eliminating the potential freezing issues in cold climates associated with steam and steam-flow controls.

FEATURES	BENEFITS
<ul style="list-style-type: none"> <li>• Annular design eliminates internal burning at low gas flow rates</li> </ul>	<ul style="list-style-type: none"> <li>• Extended tip life</li> </ul>
<ul style="list-style-type: none"> <li>• High smokeless capacity design</li> </ul>	<ul style="list-style-type: none"> <li>• Minimizes environmental impact of flaring</li> </ul>
<ul style="list-style-type: none"> <li>• Low noise design</li> </ul>	
<ul style="list-style-type: none"> <li>• High turndown design</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced operating cost (energy cost)</li> </ul>
<ul style="list-style-type: none"> <li>• Minimal air flow required for standby operation</li> </ul>	
<ul style="list-style-type: none"> <li>• Low maintenance design</li> </ul>	<ul style="list-style-type: none"> <li>• Reduced operating and maintenance costs</li> </ul>

*The unique annular LHLB flare design is the optimum design for high capacity air-assisted flares.*



*The annular swirl design of the LHLB flare prevents internal burning at low gas flow rates.*

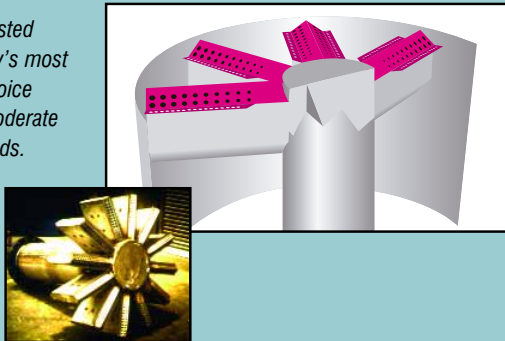


# LH™

The LH air-assisted flare is the most economical choice for small-to-moderate smokeless burning needs. The LH air-assisted flare tip lasts longer than traditional air flares and creates clean, upright flames with low radiation levels. The LH flare is ideal for application in systems with small-to-medium gas flow and also where high pressure is available.

FEATURES	BENEFITS
<ul style="list-style-type: none"> <li>Continuous air flow prevents overheating of flare tip</li> </ul>	<ul style="list-style-type: none"> <li>Extended tip life</li> </ul>
<ul style="list-style-type: none"> <li>Efficient gas/air mixing for smokeless operation</li> </ul>	<ul style="list-style-type: none"> <li>Low horsepower requirements</li> </ul>
<ul style="list-style-type: none"> <li>High turndown design</li> </ul>	<ul style="list-style-type: none"> <li>Reduced operating cost (energy cost)</li> </ul>
<ul style="list-style-type: none"> <li>Minimal air flow required for standby operation</li> </ul>	
<ul style="list-style-type: none"> <li>Low maintenance design</li> </ul>	<ul style="list-style-type: none"> <li>Reduced operating and maintenance costs</li> </ul>

*The LH air-assisted flare is industry's most economical choice for small-to-moderate smokeless needs.*



# LHTS™, LS™

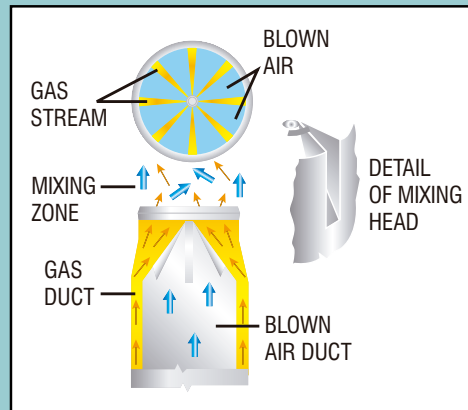
The economical LHTS and LS flare designs meet low-to-moderate smokeless requirements for low-pressure flare systems while still enabling large emergency relief rates.

# AZDAIR™

The AZDAIR flare delivers safe, smokeless operation in virtually all conditions – from maximum to minimum purge flow – without steam or support fuels. An efficient mixing head maximizes the system's gas-to-air interface. As a result, the AZDAIR flare creates a vertical, stiff, turbulent flame for a high degree of operating control.

FEATURES	BENEFITS
<ul style="list-style-type: none"> <li>Efficient mixing head design maximizes gas-to-air interface</li> </ul>	<ul style="list-style-type: none"> <li>Reduced horsepower requirements for smokeless operation</li> </ul>
<ul style="list-style-type: none"> <li>Mixing head design eliminates internal burning</li> </ul>	<ul style="list-style-type: none"> <li>Extended tip life</li> </ul>
<ul style="list-style-type: none"> <li>High turndown design</li> </ul>	<ul style="list-style-type: none"> <li>Reduced operating cost (energy cost)</li> </ul>
<ul style="list-style-type: none"> <li>Minimal air flow required for standby operation</li> </ul>	

*During normal operation, the AZDAIR flare fan operates at reduced capacity to conserve energy.*



*Relief gas moves up the AZDAIR flare's annular duct and is mixed turbulently with air blown up the flare's central duct.*





## THE WORLD'S MOST ADVANCED FLARE TECHNOLOGY FROM JOHN ZINK COMPANY

John Zink's advanced flare technologies raise the bar on clean, efficient combustion and deliver the outstanding performance our customers expect. Through the renowned John Zink Research and Development Test Center, we employ empirical and proprietary

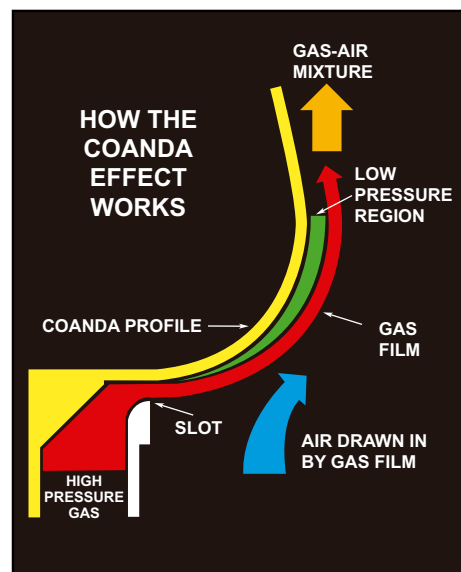
design principles, sophisticated visualization tools, computerized modeling and industrial-scale testing to develop next-generation flare systems that can be put to work today.

## COANDA TECHNOLOGY TAKES FLARE-GAS COMBUSTION TO A WHOLE NEW LEVEL

The flare experts at John Zink Company use a gas-adhesion principle known as the Coanda Effect in many flare tip designs to dramatically enhance the combustion process. These enhancements result in maximum destruction of waste gases for ultra-clean flaring.

The Coanda Effect proves that a gas jet passed over a carefully profiled, curved surface, will adhere to that surface, creating a near vacuum that pulls in substantial amounts of air. The air turbulently mixes with the gas flow, resulting in high-efficient combustion.

- Less than 10% of total heat is radiated
- Efficient combustion reduces emissions
- Low luminosity
- High atomization of liquids
- Smokeless operation



*John Zink applies the Coanda Effect to its flare tip design to harness the natural energy in relief gases, which eliminates operator need for additional system components.*

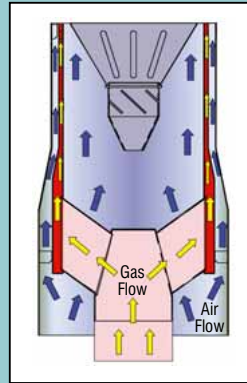
## FLAME SIMILARITY METHOD DELIVERS INDUSTRY'S MOST ACCURATE SMOKELESS PERFORMANCE PREDICTIONS

John Zink developed the Flame Similarity Method (FSM) to quantitatively calculate whether a flame will smoke. The FSM relates the fundamental measures of the momentum of the air and flared gas at the base of the flare tip to the smokeless capacity. The series of

equations accurately predicts the smokeless performance of any flare, as long as the mass flow rates and momentum of the various gas constituents can be accurately determined.

# ANNULAR FLARE DESIGN PROVIDES SUPERIOR TIP LIFE FOR LARGE AIR FLARES

To understand and eliminate internal burning in air-assisted flare tips, John Zink Company performed an extensive study on the effects of wind during low flow rates. As a result, John Zink developed the patented annular flare tip, which provides complete ignition of waste gases at high exit velocities. Waste gas exits the burner in one or more narrow annular jets, each surrounded by assist air. The annular flare design maximizes the perimeter area and extends tip life by minimizing internal burning.



*The annular air-assisted flare provides a high smokeless capacity flare that is not susceptible to the internal burning problems that are common in many large diameter air-assisted flares.*

## WINDSHIELD ADVANCEMENTS

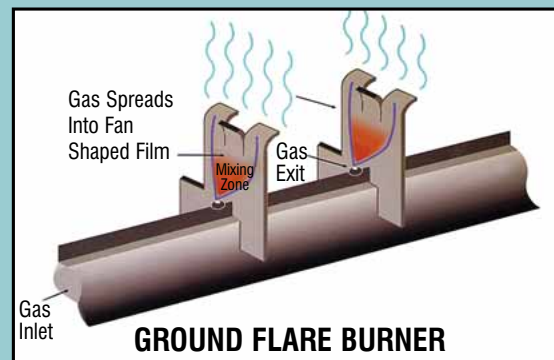
John Zink's advanced windshield designs are tested and developed to ensure flare pilots stay lit in the most extreme on- and offshore environments. Our windshield designs protect the gas-air inspirator and pilot burner to stabilize the flare system and ensure the correct gas mixture ratio is maintained.

*The WindPROOF™ pilot can remain lit and stable at wind speeds up to 160 mph and rain exposure over 30 inches per hour.*



## THE FIN PLATE BURNER DELIVERS SUPERIOR COMBUSTION EFFICIENCY WITHOUT STEAM OR AIR ASSIST

John Zink's fin plate burner's innovative fin shape acts as a flame stabilizer and enhances uniform combustion while the aerofoil-shape of its gas manifolds assists the entrainment of air. The overall effect is a matrix-style burner that produces an excellent flame with a wide turndown ratio.



1. The fin plate burner distributes the gas through a matrix of small holes adjacent to a shaped plate or fin.
2. As the gas exits the hole, it impinges on the plate and forms a thin film.
3. Air mixes effectively with the film to promote high-performance combustion.

*John Zink provides many enclosed flares to meet the unique requirements for low-pressure flares on FPSO's.*



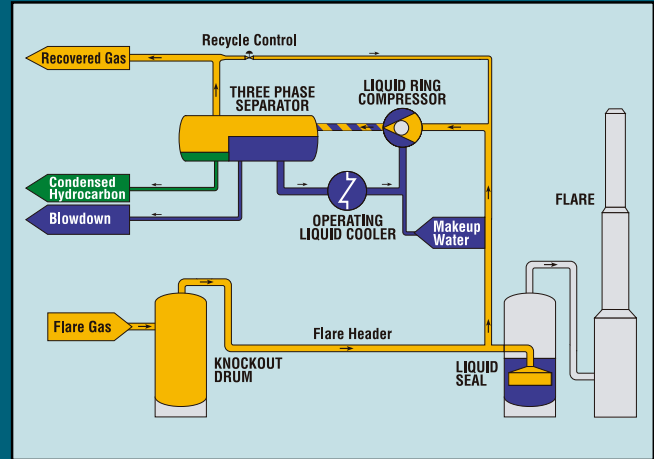


## FLARE GAS RECOVERY

JZ® Flare Gas Recovery units are a smart solution to dramatically reduce flare emissions while recovering spent gas as fuel, feedstock or product.

As a world leader in flare and recovery technologies, John Zink is the choice supplier to integrate a flare gas recovery unit with your flare system.

- Rapid return on investment
- Eliminates emissions, visible flame and odors
- Reduces overall plant emissions
- Requires minimal maintenance



## ACCESSORIES WITH A FLARE TO OPTIMIZE

The experts at John Zink Company know a single flare failure can bring about a sudden, expensive halt to your operations. The costs can add up quickly: unexpected repairs, unforeseen expenditures, environmental fines and lost production. John Zink Company's energy-efficient flare pilots, pilot monitors and control systems keep your JZ and KALDAIR flare systems operating at peak performance.

### ENERGY-EFFICIENT PILOTS

John Zink's energy-efficient pilots are engineered to stay lit in extreme wind and rain and eliminate re-ignition delays.

#### EEP-500™

The EEP-500 pilot is dependable, affordable and completely adaptable to your current operations. Installed on hundreds of flares worldwide, the long-lasting pilot uses John Zink's advanced windshield designs to ensure excellent ignition stability – even in sub-zero climates. The EEP-500 pilot consumes less natural gas than conventional pilots, saving thousands of dollars in fuel per year, per pilot.

#### WINDPROOF™ PATENTED\*

The patented WINDPROOF flare pilot uses John Zink's advanced windshield design to withstand the most severe winds and rain with outstanding performance. Det Norske Veritas, the world's most widely respected product verification and certification company, witnessed and verified that the WINDPROOF flare pilot remains lit under test conditions that exceeded 160 mph winds and 30 inch/hr of rainfall. WINDPROOF flare pilot delivers exceptional fuel efficiency and fuel flexibility with ultra-low maintenance.



Patented WINDPROOF flare pilot.



## RELIABLE PILOT MONITORS

Each of John Zink's pilot monitors is designed to ensure your flare pilot stays safely lit in remote and hard-to-access locations during the most intense wind, rain and snow.

### SOUNDPROOF® PATENTED\*

The high-fidelity SOUNDPROOF flare pilot monitor uses an acoustic sensor to provide rapid, continuous and reliable pilot verification, even under the most intense weather conditions. SOUNDPROOF pilot monitor listens for the unique frequency generated by each pilot flame, then indicates the pilot flame status on a signal processor. The flame status is also registered by contacts, which can be used for remote monitoring.



*SOUNDPROOF acoustic pilot monitoring system.*

### KEP-100™

The KEP-100 flare pilot monitor and control system uses a DC signal for continuous flame monitoring. The system uses flame ionization to automatically detect and re-ignite the pilot flame in less than 30 seconds. The KEP-100 remote control panel may be positioned up to 1,000 feet from the flare for easy, at-grade maintenance during operation.

### PILOTEYE 2000™

The PILOTEYE 2000 pilot monitor uses infrared technology to provide fast, reliable pilot verification at grade. The PILOTEYE 2000 pilot monitor's dual wavelength technology is 40 times more sensitive than single wavelength detectors for reliable flame verification in adverse weather. The user-friendly interface can be customized to suit your specific monitoring and troubleshooting needs.



*PILOTEYE 2000 infrared pilot monitor.*

### ZOOM™

The ZOOM monitor observes your flare for smoke and instantly adjusts steam levels to return the flare to smokeless operation. The savings from reduced steam consumption pays for the ZOOM system within months.

## IGNITION CONTROL SYSTEMS

### FLAME FRONT GENERATORS

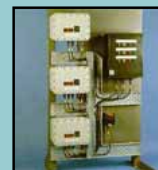
Based on extensive flare experience, John Zink's flame front generators provide reliable, remote ignition of flare pilots. A local alarm light and contacts for remote customer alarm systems are included. Automatic or manual operation is available.

### ZEUS™

The ZEUS electric ignition device uses an air-cooled sparking tip to produce a high-energy discharge that instantly ignites the pilot. The ZEUS system monitors the EEP-500 pilot with solid-state electronics and controls that can be located up to 1,500 feet from the pilot.

### KEP-100™

The KEP-100 ignition system delivers a reliable spark within the pilot nozzle for instantaneous ignition. The KEP-100 remote control panel may be positioned up to 1,000 feet from the flare for easy access.



*KEP-100 automatic electronic pilot ignition control system.*

## OTHER ACCESSORIES

John Zink offers a complete range of control systems to keep flares operating at maximum performance with long life and even longer maintenance intervals. Retractable thermocouples, steam controls, blower controls for air-assisted systems and explosion-prevention systems are available for virtually every application.





## A TRADITION OF EXCELLENCE AND INGENUITY

### EXPERIENCE

In virtually every nation, across virtually every market, John Zink Company offers a breadth and depth of combustion skill, science and synergy that serve our customers long into the future. We are committed to providing the highest level of excellence in our systems and service through quality, performance and customer satisfaction.

### RESOURCES

With more than 300 engineers and technical experts, John Zink Company is recognized as the authority on combustion science and clean-air innovation. Our resources include cutting-edge research and development, industrial-scale testing, world-class manufacturing and around-the-clock service and support.

### TECHNOLOGY

John Zink's range of capabilities is unmatched in the industry and provides a strong foundation for exploring the next generation of clean, economical combustion. Advanced problem solving is a hallmark of John Zink Company and has earned us a reputation for taking on the toughest challenges. Our Research and Development Test Center is the nerve center for exploring new technologies that address cleaner, more efficient combustion. Here, John Zink designs and tests JZ and KALDAIR flares for the world's largest oil and gas production operations.



*John Zink and its many brands of advanced combustion and pollution-control systems lead global industry with a vast base of successfully operating systems.*

## STATE-OF-THE-ART FLARE TEST FACILITY

At John Zink's Research and Development Test Center, our team of engineers tests combustion equipment under actual and simulated industrial-scale conditions to demonstrate system performance and collect critical data used to optimize real-life operation.

John Zink offers unparalleled capabilities for testing equipment under a broad range of operating conditions. Our state-of-the-art

computer networks and proprietary software enable advanced problem solving, remote test control and monitoring, and real-time data trending to characterize product design and record emissions and combustion performance.



*John Zink Company's Research and Development Test Center is located on the campus of the company's world headquarters in Tulsa, Oklahoma.*

## JOHN ZINK COMPANY - YOUR FLARE PARTNER

The flare-system decisions you make today will impact your operation and cost of doing business for years to come. Don't settle

for less than the best. Call John Zink Company for all your JZ and KALDAIR flare systems and technologies.







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\* Condaire is covered by one or more of the following Patents: U.S. Patent Number 4634372, CA Patent Number 1254396, FR, IT, NL, GB Patent Number 153866, DE Patent Number 3569020.8, DK Patent Number 161411, NO Patent Number 158268

\* LHLB is covered by one or more of the following Patents: U.S. Patent Number 5810575, 5846068, CA Patent Number 2226809.

\* WindProof is covered by U.S. Patent Number 6702572 B2. Patents Pending in CA, CN, EPC, ES, SE, CH, GB, JP, KR, TR.

\* SoundProof is covered by one or more of the following Patents: U.S. Patent Number 5813849, CA Patent Number 2212403, EPC Patent Number 935098, DE Patent Number 69810072.7 and AU Patent Number 745552. Patents Pending in AU, JP, KR, KW, SA, VE.

