

# **REDUCING COMBUSTION EMISSIONS IN MANUFACTURING APPLICATIONS**

**Honeywell**

# THE INDUSTRY- WIDE DRIVE TO LOWER EMISSIONS

Industrial manufacturers that use thermal processes are under pressure to reduce combustion byproducts, especially  $\text{NO}_x$  – a collective term for nitric oxide (NO) and nitrogen dioxide ( $\text{NO}_2$ ) – to meet tightening global emissions regulations.

In addition to facilitating compliance, lowering emissions is an important part of many companies' corporate sustainability initiatives, and – in sectors such as food production – high emissions levels can have a direct impact on product quality.

Whatever their motivation, industrial manufacturers are seeking new ways to reduce pollutants without sacrificing the performance and quality levels they need to stay competitive – something that's not always easy to accomplish.

Honeywell Thermal Solutions – which incorporates the Honeywell, Eclipse, Exothermics, Hauck, Kromschröder and Maxon brands – is leading the way in helping manufacturers achieve their low emissions objectives. With a track record of innovation spanning 100 years, Honeywell burners and control systems are designed to help customers meet strict emissions standards while maximizing productivity.



## NAVIGATING REGULATORY COMPLEXITY

One issue any global manufacturer faces is how to maintain simultaneous compliance with multiple emission standards. Some standards are set nationally while others are enforced at a regional, state or even city level. Navigating the sheer volume, variation and constant changes in these requirements is a significant challenge.

Given the constant changes to standards and regulations around the world, and the fact that every combustion application is unique, reducing industrial emissions is a continuous process that requires a strong understanding of safe, industry-proven techniques.

This regulatory know-how has been captured in every Honeywell Thermal Solutions offering, and it's one reason why customers around the world turn to Honeywell to help them lower emissions.

## THE HONEYWELL DIFFERENCE

To meet the latest regulations, every Honeywell combustion solution has been designed and honed via an exhaustive R&D process. Each burner and control system, for example, is engineered and lab tested to optimize performance.

Furthermore, Honeywell applies deep application knowledge to fine-tune each burner to achieve stand-out emissions results for specific use cases, from high temperature metal and glass applications to low temperature automotive and textile manufacturing.

Honeywell's longstanding pursuit of lower emissions has produced numerous innovations that help reduce pollutants. For example, the Maxon SMARTFIRE® control system provides precise, electronic control of air and fuel to natural gas and oxygen fired burners, which maintains emissions and fuel efficiency over the operating range of the burner. Meanwhile, the Elster® GasLab Q2 Gas Quality Analyzer monitors and adapts gas mixtures for optimal emissions in a variety of applications. Another innovation is Honeywell's O<sub>2</sub> trim capability, which measures oxygen in control systems in real-time, and automatically adjusts the air/fuel ratio for the best NO<sub>x</sub> results.

Beyond its reputation for innovation, Honeywell stands out for the completeness of its offering. With the deepest, broadest portfolio of low emissions products in the industry, Honeywell is the only supplier with an end-to-end solution incorporating burners, valves, sensors and controls. Together with unparalleled global service and support capabilities, Honeywell provides industrial manufacturers with a one-stop shop for meeting any emissions requirement.



# HONEYWELL'S LOW EMISSIONS BURNER PORTFOLIO

Honeywell's burner portfolio represents the latest in industrial burner technology and covers a wide variety of applications, providing efficient heat delivery while meeting stringent emissions regulations. Key solutions include:

## ASPHALT

- Hauck MegaStar
- Hauck NovaStar

## AUTOMOTIVE

- Eclipse Winnox
- Maxon CROSSFIRE®
- Maxon KINEDIZER® LE
- Maxon M-PAKT®
- Maxon OVENPAK® LE

## CERAMICS

- High temperature applications:
  - Kromschröder menox® BIC..M
- Low temperature applications:
  - Eclipse Winnox
  - Maxon CROSSFIRE®
  - Maxon M-PAKT®
  - Maxon OVENPAK® LE

**Kromschröder ECOMAX® LE** is Honeywell's next generation self-recuperative burner for indirect radiant tube heating. Offering best in class NO<sub>x</sub> emissions and improved efficiency over the current Ecomax, it is ideal for furnace OEMs and furnace operators that need to meet strict NO<sub>x</sub> emissions performance requirements worldwide.

## CHEMICALS

- Eclipse Winnox
- Honeywell XPO™
- Maxon KINEDIZER® LE
- Maxon OPTIMA™

## COMMERCIAL HVAC

- Eclipse Linnox ULE
- Maxon XPO™

**Maxon KINEDIZER® LE** is a nozzle-mix, medium-velocity natural gas burner. Using advanced mixing technology, it produces low emissions with little excess air. Ruggedly built with a reinforced refractory block and steel burner body and nozzle, Maxon KINEDIZER LE burns natural gas, propane and other gaseous fuels.

## FOOD & BEVERAGE

- Eclipse Linnox ULE
- Eclipse Minnox
- Eclipse Winnox
- Maxon CROSSFIRE®
- Maxon KINEDIZER® LE
- Maxon M-PAKT®
- Maxon OPTIMA™
- Maxon OVENPAK® LE

## GLASS

- Eclipse BrightFire 200
- Eclipse PrimeFire FH
- Maxon OXY-THERM® FHR
- Maxon OXY-THERM® LE

## METALS

- High temperature applications:
  - Eclipse Furnnox
  - Hauck Wall Hugger Invisiflame®
  - Kromschröder ECOMAX® LE
  - Kromschröder menox® BIC..M
  - Hauck TriOx
- Low temperature applications:
  - Eclipse Linnox ULE
  - Eclipse Minnox
  - Eclipse Winnox
  - Maxon CROSSFIRE®
  - Maxon KINEDIZER® LE
  - Maxon OVENPAK® LE

**The Eclipse Linnox ULE** burner is designed for direct or indirect fired air heating applications requiring state-of-the-art burner technology. It employs high excess air pre-mix combustion that keeps flame temperatures low while burner geometry establishes an internal recirculation flame pattern. The result? Ultra-low emissions of less than 15 ppm NO<sub>x</sub> and uniform heat.

## MINERALS

- Maxon KINEDIZER® LE
- Maxon OPTIMA™

## MINING

- Eclipse Minnox

## PRINTING & COATING

- Eclipse Linnox ULE
- Eclipse Winnox
- Maxon CROSSFIRE®
- Maxon KINEDIZER® LE
- Maxon M-PAKT®
- Maxon OVENPAK® LE

**The Maxon OXY-THERM® FHR** burner reduces fuel consumption in high temperature (>1400°F) applications. The higher flame temperature of oxy-fuel firing increases the available heat and radiant heat transfer to most applications. Results include improved thermal efficiency, increased processing rates, higher product quality, reduced flue gas volumes and lower emissions.

## PULP & PAPER

- Eclipse Linnox ULE
- Eclipse Winnox
- Maxon CROSSFIRE®
- Maxon M-PAKT®
- Maxon OPTIMA™
- Maxon OVENPAK® LE

## REFINING & PETROCHEMICAL

- Eclipse Winnox
- Maxon XPO™
- Maxon KINEDIZER® LE
- Maxon OVENPAK® LE

## TEXTILES

- Eclipse Linnox ULE
- Maxon CROSSFIRE®
- Maxon M-PAKT®
- Maxon OVENPAK® LE

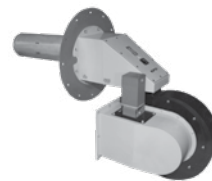
**Maxon OVENPAK® LE** is a nozzle-mixing gas burner for direct-fired industrial applications where clean combustion and high turndown are required. It produces a wide turndown range and a stable flame under a variety of operating conditions, while a balanced pressure feature makes it resistant to firing chamber pressure fluctuations.



Maxon CROSSFIRE®



Maxon OVENPAK® LE



Maxon XPO™



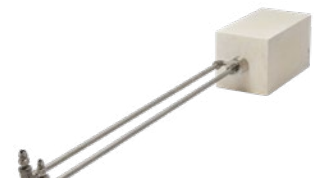
Maxon OXY-THERM® LE



Kromschroder ECOMAX® LE



Eclipse Linnox ULE



Eclipse PrimeFire FH

# CASE STUDY



## **KEMCO SYSTEMS HELPS CUSTOMER MEET STRICT LOCAL EMISSIONS REGULATIONS WITH HONEYWELL BURNERS**

When Kemco systems, a Clearwater, Florida-based maker of direct contact water heaters wanted to achieve the lowest possible NO<sub>x</sub> emissions for its customer – a Southern California uniform laundering company – it turned to Honeywell. When equipped with Eclipse Winnox burners, Kemco's water heaters produced the continuous hot water required for the thorough, consistent cleaning of rental uniforms, and crucially helped the customer meet tough South Coast Air Quality Management District NO<sub>x</sub> standards, with NO<sub>x</sub> output of just 20 ppm.



## **SWEDISH MINING COMPANY BOLIDEN ACHIEVES ULTRA-LOW NO<sub>x</sub> VENTILATION EMISSIONS WITH HONEYWELL MAXON**

To heat the air of its underground mining ventilation systems in compliance with tightening NO<sub>x</sub> regulations, Swedish mining company Boliden selected an ultra-low NO<sub>x</sub> burner solution from Honeywell Maxon. By combining Maxon Optima SLS and M-PAKT® burners equipped with individual pipe trains and Maxon control and shut off valves, Boliden gained a turnkey system for its heating requirements. Running between 325kW and 6,000kW on propane, the Maxon system achieved a CO reading below 2 ppm – well below the company's emissions target.



## **IVAGO CUTS WASTE DISPOSAL EMISSIONS IN GHENT WITH HONEYWELL TECHNOLOGY**

IVAGO, a Belgian waste disposal company, is chartered with incinerating the entire waste of the city of Ghent – equating to 100,000 tons/year – with nothing going to landfill. To ensure its operation remained compliant with forthcoming EU emissions regulations, IVAGO fitted Eclipse Linnox burners to the catalytic deNO<sub>x</sub> system in its incinerator. Through the efficient reheating of flue gas, the Linnox burners produced less than 9 ppm NO<sub>x</sub> while providing uniform heat distribution over the duct width and a wide modulating range. The result? IVAGO comfortably met the EU regulations, and the incineration efficiency improvements driven by the Linnox burners have helped extend the life of its reactor.

## **FORGING COMPANY ATTAINS LOW NO<sub>x</sub> FURNACE PERFORMANCE WITH HONEYWELL ECLIPSE**

When designing two new furnaces from which to forge alloy jet engine parts, Carlton Forge Works of Paramount, California selected Honeywell Eclipse Furnnox burners for the lowest possible NO<sub>x</sub> emissions. Its previous furnaces used another manufacturer's burner and emitted approximately 45 ppm NO<sub>x</sub>. However, Carlton Forge faced looming, stringent state regulations. Equipped with Furnnox burners, the new, twin furnaces emitted just 34 ppm NO<sub>x</sub>, with a further reduction achieved by lowering excess exhaust air. Thanks to the Furnnox burners, Carlton Forge not only attained its compliance objectives, but it set a new, company-wide benchmark for low NO<sub>x</sub>.



## Learn more

For more information about Honeywell's low emissions portfolio, please visit

[ThermalSolutions.Honeywell.com](https://thermalsolutions.honeywell.com)

or contact your Honeywell Thermal Solutions representative.

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