

**INNOVATIVE SOLUTIONS FOR
COMBUSTION AND EMISSIONS
CHALLENGES**

**Process Heater Burners, Flare
Systems, Thermal Oxidizers
and Catalyst Systems**



Callidus Technologies by Honeywell - Experience

With over two decades of overcoming combustion and emissions challenges, Callidus Technologies by Honeywell consistently leads the industry by setting the standards for maximum performance and minimum emissions.

Burners that set the standards

Innovation and technology are the keys to Callidus burners. For over two decades, our team has been on the leading edge in designing burner equipment. The burner design group has worked in cooperation with our customers to develop the technology and solutions to some of the greatest challenges in the reduction of NO_x. Callidus set the standard with the patented low emission (LE) burner achieving NO_x levels of 20 ppm. More recently, Callidus again demonstrated

its technical expertise and leadership with the introduction of the next generation Ultra Low NO_x CUBL burner. The CUBL has demonstrated exceptional stability, reliability and performance under the most stringent emissions regulations, regularly operating between 10-15 ppm in the field.

Callidus burners can be found in fired heaters and burner related services for the refining and petrochemical industries across the globe.

Callidus burners consistently demonstrate the lowest NO_x rating and highest quality on the market today. Call on Callidus to help you resolve your specific emission challenges.

Applications

- Refinery process heaters
- Reforming furnaces
- Cracking furnaces
- Coking furnaces

Burners

- Forced and natural draft
- Conventional and low NO_x
- Gas, liquid or combination
- Ambient or preheated forced draft
- Radiant wall
- Pre-mix applications

Specialty Burners

- Ultra low NO_x
- Low Btu gas burners
- Vertical up or down and horizontal fired



Radiant Wall Burner



Ultra Low NO_x - CUBL Burners



Flat Flame Low NO_x Burners

ence, Integrity, Professionalism, Technology

Innovative Flare Design

Callidus develops flares and vapor control systems that are designed to match the customer's specifications, process criteria and performance requirements. Our flare equipment functions at optimum levels meeting EPA and international standards while safeguarding plant and terminal operations. With thousands of flare system start-ups worldwide, you will find our flares and flare systems operating in hydrocarbon processing, oil and gas production, petrochemical processing and the steel and carbon black industries. Call Callidus' flare experts to assist you with your technical needs.

Applications:

- Hydrocarbon processing
- Oil & Gas production
- Steel industries
- Carbon black industries
- Petrochemical industries
- Offshore/onshore production
- Terminals

Flares and Flare Systems:

- Pipe flare
- Multipoint smokeless flare
- Steam smokeless flare
- Ultra low-noise steam flares
- Totally enclosed ground flare
- HP gas assisted flare
- Air assisted flare
- Low Btu flare
- Pit burners
- Portable flare
- Offshore flare
- Production flare

Vapor Control Systems

- Marine vapor combustors
- Truck vapor combustors
- Rail car loading/cleaning combustors

Associated Auxiliary Equipment

- Knock-out vessels
- Liquid seal vessels
- Ignition systems
- Pilot monitors



Internal Steam Flare



Totally Enclosed Ground Flare (TEGF)



Multipoint Steam Flare



Multipoint Smokeless Flare

Thermal Oxidizers to meet your requirements

Let our experienced thermal oxidizer engineering group focus on meeting your individual requirements. Our broad base of incinerator designs and wealth of experience allow us to evaluate your environmental problems and provide custom designed solutions for your specific situation. Callidus incineration systems are in service in a variety of gas and liquid waste applications including halogenated, chlorinated, fume, tail gas and nitrogen bearing wastes. Each system is designed and built to meet the highest quality standards and to meet or exceed the latest environmental regulations including NO_x standards.



Down-Fired Thermal Oxidizer

Applications:

- Fume and vent streams
- Sulfur plant tail gas streams
- Carbon black tail gas streams
- Wastes containing salts
- Halogenated organic wastes
- Nitrogen bearing wastes
- Acrylonitrile process wastes
- Spent solvents
- Pharmaceutical plant wastes
- Petrochemical plant wastes
- Hazardous waste streams

Thermal Oxidizer Systems:

- Fume incinerator
- Tail gas incinerator
- Halogenated waste incinerator
- Low NO_x (deNO_xidizer™) system
- Down-fired incinerator
- Catalytic oxidizers

Catalyst Systems

Callidus can help you reduce levels of NO_x, CO and hydrocarbon emissions for Simple Cycle Catalyst Systems and Selective Catalytic Reduction Systems (SCR). Serving the power and process industries, each catalytic system is custom designed to meet each clients individual operational and emissions specifications.

Power Installations:

- Flow distribution device
- Ammonia injection grid
- Catalyst and associated equipment
- Silencing equipment
- Ammonia vaporization/flow control
- Outlet stack with EPA test ports

Process Installations:

- Dilution air system
- Catalyst and associated equipment
- Ammonia vaporization
- Inlet/exhaust ducting
- Reheat burner (as required)



Low NO_x (deNO_xidizer™) Thermal Oxidizer

Field Service and Parts

We recognize that the value of our equipment is dependent on performance. Our experienced field service personnel are dedicated to ensuring that our equipment is installed properly and operated with maximum efficiency throughout its functional life. Callidus also provides a range of rental flares available for various applications. Contact one of our representatives for further information regarding rental equipment.

Callidus provides full-service spare parts and retrofitting capabilities for our own and other manufacturers' equipment. We can replace existing components with Callidus parts or upgrade equipment to enhance performance.

Our global commitment to total customer service ensures that Callidus products and systems meet the expectations of our clients.

Our Services Include:

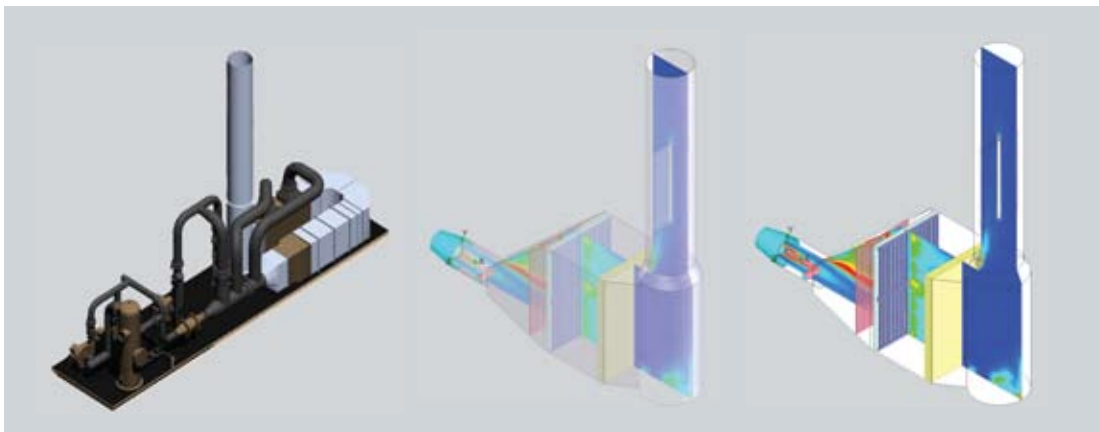
- Turnkey installation
- Operator training
- Tuning for optimum performance
- Rental flares
- Troubleshooting equipment performance
- Individual part replacement
- Retrofitting for enhanced performance



Inlet of SCR System



Global Field Service



3D modeling plays an integral part in SCR system development

Thermal and flow computer simulations are used in each system we design

Research and Development

Callidus is committed to being the leader in environmental and combustion technology discoveries. We know that a part of our success is directly related to our investment in research and development. Our industrial scale R&D center is the prime example of this investment. The facility is designed to test burners, thermal oxidizers and flares. The center is fully instrumented with computerized data acquisition systems devoted to research and development of new products, product improvements, new combustion processes and problem solving applications.

Because of our expertise, innovation, flexibility and emphasis on customer service, Callidus has been selected on multiple occasions to work in cooperation with our clients to develop cutting-edge equipment and solutions to specific process challenges and needs.

Flare Test Capabilities:

- Multipoint
- Enclosed ground
- Production flares
- Steam assist
- Air assist
- Offshore

Burner Test Capabilities:

- 7 test furnaces
- Low NO_x
- Radiant wall
- Gas, liquid or combination
- Vertical and horizontal fired
- Ultra Low NO_x

Thermal Oxidizer Test Capabilities:

- Down-fired incinerator
- Quench system
- Low NO_x deNO_xizer™
- Fume incinerator
- Controls and instrumentation

Computational Fluid Dynamic Modeling

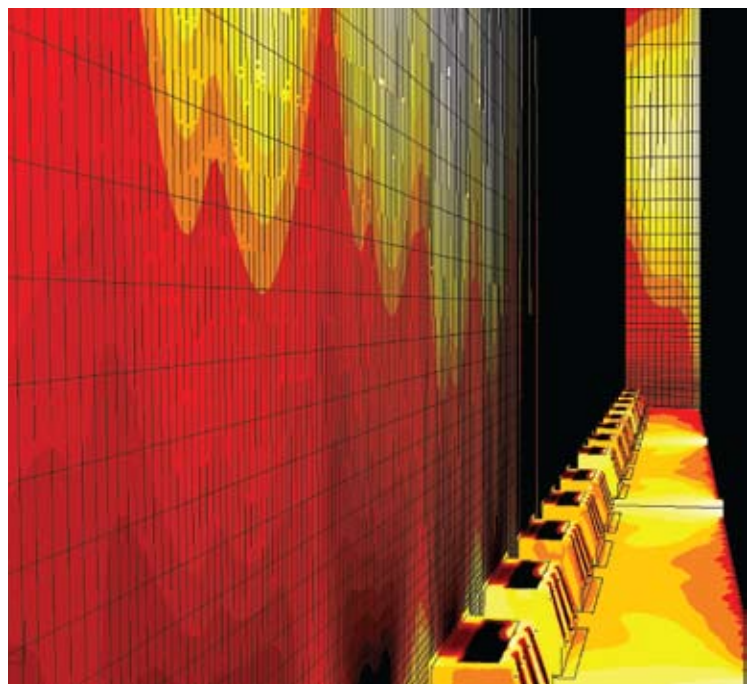
Our in-house Computational Fluid Dynamic Modeling (CFD) capabilities are used for engineering analysis of critical applications. CFD creates three-dimensional models of fired equipment in conjunction with Fluent® software to solve thermodynamic equations. When our CFD models are combined with real world experience and years of Callidus proven R&D, we are able to predict field performance of entire systems and are able to avoid potential performance problems prior to fabrication.

Typical Applications:

- Rapid prototyping of custom-designed equipment
- Performance confirmation of upgrade and retrofit projects
- Resolution of issues with challenging in-field equipment
- Pre-purchase product assessment



Burner test facility houses seven test furnaces



Thermal modeling using computational fluid dynamics

Quality and Manufacturing

Our manufacturing facility demonstrates the highest quality standards in the industry. In some cases, many of our internal quality assurance programs require higher performance standards than some industry certifications.

Callidus fabrication and manufacturing is certified ISO 9001:2000 in USA and China.

Callidus manufacturing and fabrication facilities are upgraded on a continual basis. Our current facilities in Oklahoma and China occupy over 115,000 sq. ft. consisting of proven manufacturing techniques and equipment. As a global player in the combustion equipment market, some of our fabrication takes place around the world in strategic locations, while proprietary items are fabricated at our U.S. facility.

At Callidus, quality assurance is everyone's job. Every step of the project is consistently reviewed to ensure that we live up to the expectations of the customer.

Global Installation Teams

Callidus installation teams provide first-class service to our customers. Familiarity and experience with Callidus product lines enable us to provide enhanced product management and efficient, expedient turn-a-rounds with a high level of quality control.

Advantages:

- Product knowledge and experience
- Project management
- Cost controls
- Project reporting
- Modularization
- Quality control
- Identify, resolve unexpected surprises



Callidus manufacturing emphasizes safety, quality and accuracy



Callidus China Fabrication Facility

Test Facility

The Callidus test facility is in continual use for combustion technology research and development as well as customer witnessed demonstrations. Our array of test systems allows us to closely match actual field operating conditions, providing results which will more accurately predict actual measured performance.



Callidus 82,000 sq. ft. manufacturing and fabrication facility in USA



Callidus headquarters - Tulsa, Oklahoma. USA

ISO 9001:2000 Certification



USA Certification

China Certification

Global Coverage

Callidus reaches the global market through our headquarters located in Tulsa, Oklahoma, USA, regional direct sales offices in Shanghai, China; Brussels, Belgium; Mumbai, India and Sao Paulo, Brazil and with independent sales representation around the world.

Meeting our customers' expectations and setting the standards for the combustion industry have always been our company goals. Each burner, flare, thermal oxidizer and catalyst system we design and manufacture is built with those goals in mind.

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