

# Callidus Ultra-Blue Burner (CUBL)

**Honeywell**



DESIGNED FOR ULTRA-LOW NO<sub>x</sub> EMISSIONS

**Advanced Burner Technology**

 **CALLIDUS  
TECHNOLOGIES**  
by Honeywell

# Callidus Ultra-Blue (CUBL) Burners

**The Callidus Ultra-Blue (CUBL) is rapidly becoming the preferred Ultra-low NO<sub>x</sub> process burner.**

An innovative design has been employed which increases the burner's stability and allows for optimal performance on typical refinery fuel gases and 100% natural gas. The new design also increases the tile exit velocity which enhances fuel/flue gas/air mixing, providing a shorter, "stiffer" flame as compared to other next generation Ultra-low NO<sub>x</sub> burner designs.

Using our extensive engineering experience and ground breaking innovation, Callidus designed the CUBL to meet our customers' challenges.

**With specific requests and developmental mandates from the industry's leading companies, the CUBL was created with these distinct advantages:**

## **No special operating needs**

- The CUBL does not require start-up lances or special procedures
- Operations are no different than a conventional burner

## **Able to fit in virtually any application**

- Natural draft or forced draft
- Flat flame or round flame
- 2 MM Btu/hr to 45 MM Btu/hr with higher levels possible
- Round flame tile has the smallest diameter of any comparable duty, ultra-low NO<sub>x</sub> burner available, allowing for retrofits without floor modifications
- Fires — vertical (up or down) or horizontally
- Operates with a wide range of fuels
- Perfect for retrofit of older heaters originally designed for conventional raw gas and premix burners

## **Extremely Stable**

- The CUBL is stable and can achieve 10 to 1 turndowns

## **Shorter Flame Lengths**

- Typical flame length of (1.56 m/MW)

## **Better NO<sub>x</sub> Reduction**

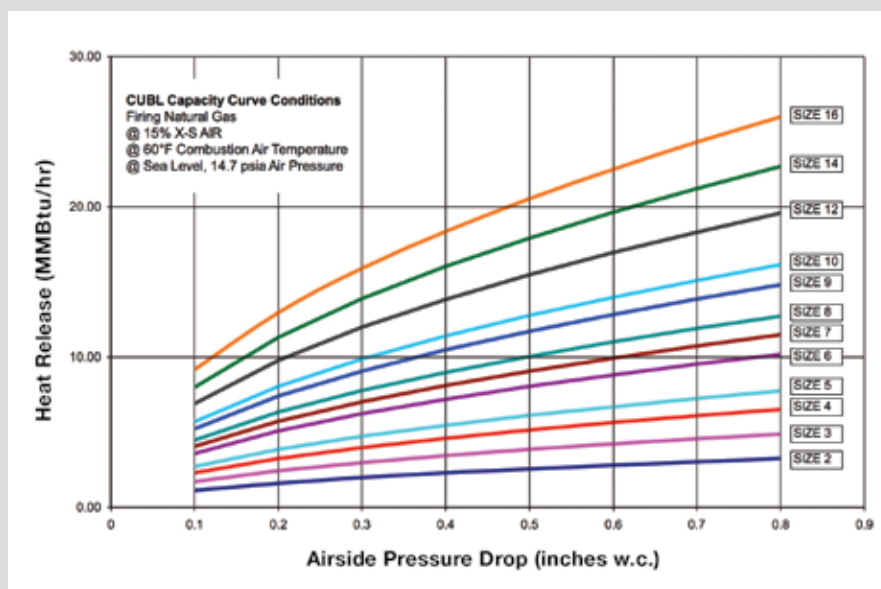
- 10-20 ppmv are typical without any additional technologies (steam, external flue gas, etc.)
- The CUBL is a highly staged, internal flue gas recirculation burner

## **Reduced Maintenance**

- No metallic flame holders to burn up
- Primary tips are well away from the combustion and cooled by air stream
- Staged tips are shielded by refractory

## CUBL Capacities

Heat Release vs. Airside Pressure Drop



## CUBLF

Designed for cracking and coking furnace applications, the CUBLF is suitable for firing up a wall, across the floor or free standing in the furnace.

### Mechanical safety and integrity

- Burner tiles use no metallic parts creating better thermal expansion while providing longer burner life

### Control flame quality

- Reduced tile size results in thinner flames eliminating rollover
- All tip drillings are carefully engineered and tested to optimize heat flux profile

### No special operating needs

- CUBLF does not require start-up lances or special procedures
- Emissions with less than 40 ppmv in the field

## CUBL-DF

The CUBL-DF takes the proven CUBL technology one step further incorporating the use of separate manifolds to fire PSA or off-gases. The results are incredibly low NO<sub>x</sub> levels. Additionally, the improved exit velocity from the CUBL-DF tile minimizes the flame leaning that can sometimes occur in a down fired reformer. Callidus has supplied thousands of down-fired CUBL-DF burners for reformers in hydrogen, ammonia and methanol service.

### Key Features:

- Fuel source flexibility
- Low maintenance
- Outstanding combustion performance
- Ultra-low NO<sub>x</sub>

## CUBLX

Based on the proven CUBL technology, the CUBLX burner uses a series of primary combustion air inductors designed to maximize the amount of air that is introduced into the primary combustion zone of the burner.

This added technology provides outstanding performance for furnaces with low-draft operations, short radiant box heights, tight burner-to-burner spacing or internal currents that prove to be a challenge for other "Next Generation" burner technology. This advanced technology gives the CUBLX its ability to produce 40% more heat capacity in comparison to other "Next Generation" burner that require larger heater floor cut-outs.

### Key Features:

- More duty from a smaller burner
- Shorter, stiffer flames (1.3 m/MW)
- Smaller burner circles or more burner to burner spacing
- Ultra-low NO<sub>x</sub>



Ultra-low NO<sub>x</sub> CUBLX Burner

## CUBL-HC

The CUBL-HC burner takes advantage of the CUBL technology and applies it in high capacity, forced draft situations. In these applications, large heat releases are required and there is additional need for shorter flames than traditional ultra-low NO<sub>x</sub> burners. Utilizing the high airside pressure drop available on most high heat release, forced draft projects, the CUBL-HC yields ultra-low NO<sub>x</sub> emissions and compact flames.

### Key Features:

- Flame Lengths as short as 0.5 ft/ MMBtu (0.52 m/MW)
- Compact design retrofits into the most challenging furnaces
- Suitable for high airside pressure drop applications.
- Stable through a 10:1 turndown
- Modular design is adjustable for retrofit projects using existing cut-outs and air delivery systems



Ultra-low NO<sub>x</sub> CUBL Burner



Callidus headquarters - Tulsa, Oklahoma. USA

### Global Coverage

Callidus reaches the global market through our headquarters located in Tulsa, Oklahoma, USA, regional direct sales offices in China, Belgium, India and 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 system we design and manufacture is built with those goals in mind.

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### Computational Fluid Dynamic Modeling

Our in-house Computational Fluid Dynamic Modeling (CFD) capabilities combined with Fluent® software creates 3-D models of fired equipment. These CFD models are combined with real world experience and years of Callidus proven R&D, to predict field performance of entire systems to avoid potential performance problems prior to fabrication.

### Advanced Manufacturing and Fabrication Capabilities

Upgrading our manufacturing and fabrication facilities is an ongoing process at Callidus. Our fabrication facilities employ the latest manufacturing practices and equipment. As a global leader in the combustion technology market, much of our fabrication occurs in strategic locations around the world. This approach makes good economic sense, and provides our customers the best value for their combustion system.

### Quality In Everything We Do

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 are certified ISO 9001:2008 in USA and China.

### ISO 9001:2008 Certification



USA Certification

China Certification

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.

### R&D Test Facility

The Callidus, 290 acre, R&D 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

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