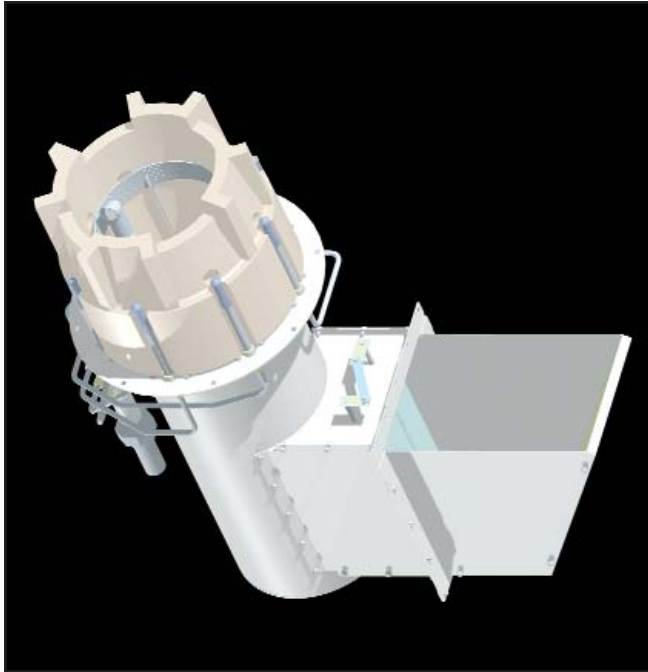




# COOLSTAR™ BURNER

## THE INDUSTRY'S MOST COMPACT ULTRA LOW-NO<sub>x</sub> GAS BURNER



John Zink Company, LLC, a world leader in clean combustion technologies and environmental systems, introduces the **patented\* COOLSTAR burner** – the industry's most compact, ultra low-NO<sub>x</sub> gas burner.

The **COOLSTAR burner** applies John Zink's proprietary flue-gas entrainment and mixing strategy using the potential energy of incoming fuel and air streams. The result? Stable, compact flames and single-digit NO<sub>x</sub> in some refinery conditions.

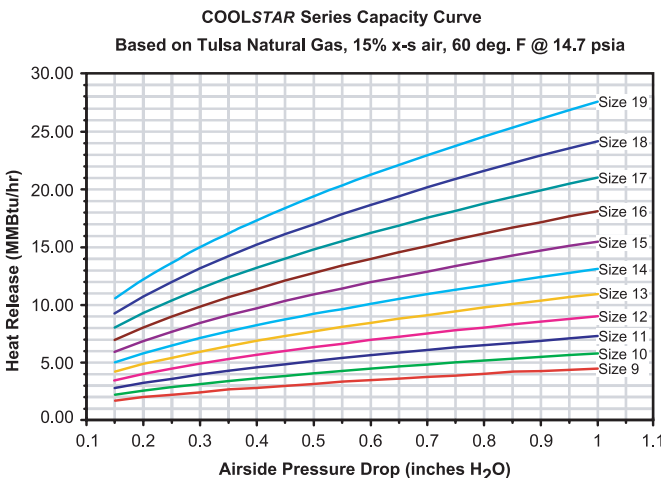
John Zink's engineers developed the **COOLSTAR burner** from the customer's point of view with a focus on safety, easy operation and optimum performance. Its compact design fits the furnace cutouts of conventional burners with little to no modifications. The **COOLSTAR burner** requires minimal maintenance and operates with a range of fuels, setting a new standard for economical, ultra low-NO<sub>x</sub> combustion.

### COOLSTAR BURNER FEATURES

- **Ultra Low-NO<sub>x</sub>**
  - Reduces emissions by as much as 90%
  - Delivers single digit (ppm) NO<sub>x</sub> in some refinery conditions
- **Compact Size**
  - Installs into existing burner opening with little to no modifications
- **Easy Operation**
  - Provides stable cold-furnace start-up
  - Features single fuel-gas connection
  - Features single air control
- **Low Maintenance**
  - Fewer tips and larger orifices than other burners in its class
  - Tips positioned in furnace floor for protection from heat
- **Short, Stable Flame**
  - Exhibits short, visible flame (as low as 1.5 ft/MMBtu)
- **Wide Range of Fuels**
  - Natural gas through refinery fuel containing H<sub>2</sub> and other components
- **High turndown**
  - 4:1 and higher turndown

JZ Burner	Predicted NO <sub>x</sub> (ppm)	Heater Cutout (in.)	Tile O.D. (in.)
COOLSTAR-15	8	25.5	24.25

Predicted NO<sub>x</sub>: Single burner test furnace for comparison basis  
 Fuel: 50% natural gas; 25% propane; 25% hydrogen  
 Furnace temperature: 1600°F  
 Draft: 0.3 inches H<sub>2</sub>O  
 Heat release: 8 MMBtu/hr



\* The COOLSTAR Burner, US Patent No. 6695609 has patents pending in other countries.

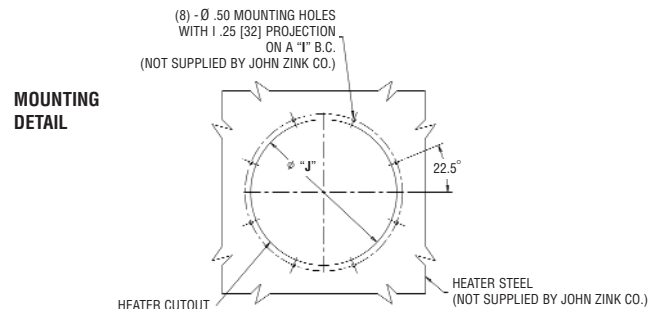
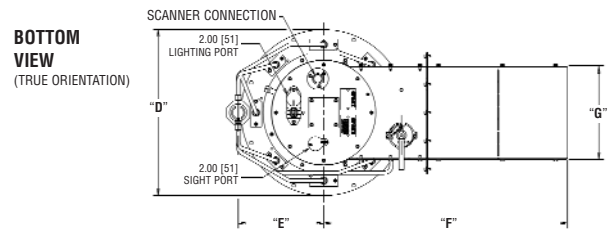
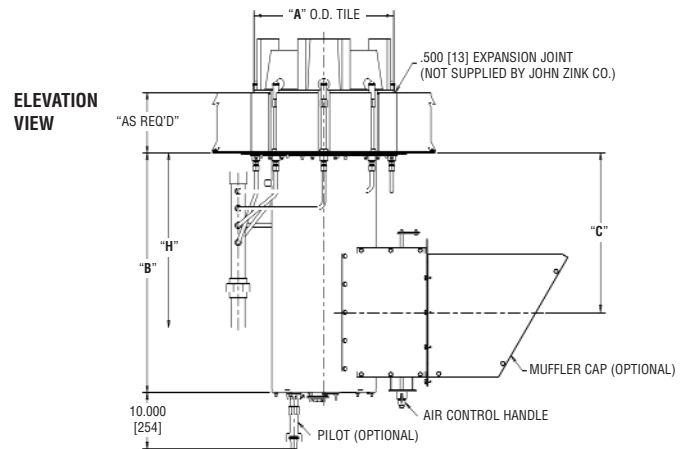
# COOLSTAR BURNER SPECIFICATIONS

- Natural or forced draft gas burner
- Compact, round flame
- Vertically or horizontally mounted
- Ideal for ultra low-NO<sub>x</sub> process heater applications

At John Zink, the process energy challenges facing global industry today inspire us to push the limits of combustion science to help our customers operate cleaner, more efficiently, and more economically. In virtually every nation on earth, across the industries that shape our global economy, John Zink drives the future of clean combustion.

To learn how the **COOLSTAR** burner can optimize your plant operations, contact John Zink today.

Burner Size	Tile O.D.	Plenum Depth	Centerline of Damper	Tile Plate O.D.	Fuel Connection	Muffler from Centerline	Width of Muffler	Fuel Connection	Bolt Circle	Heater Cutout
Dimension	A	B	C	D	E	F	G	H	I	J
9	18.5	33	23.5	23	12	26.3425	10.25	27.6875	21.5	19.5
10	19.5	34.5	24.25	24	12.5	29.0925	11.25	27.6875	22.5	20.5
11	20.5	36	25	25	13	31.8425	12.25	30.6875	23.5	21.5
12	21.5	37.5	25.75	26	13.5	34.5925	13.25	30.6875	24.5	22.5
13	22.5	39	26.5	27	14	37.3425	14.25	30.6875	25.5	23.5
14	23.5	40.5	27.25	28	14.5	40.0925	15.25	30.6875	26.5	24.5
15	24.5	42	28	29	15	42.7175	16.25	30.6875	27.5	25.5
16	25.5	43.5	28.75	30	15.5	45.4675	17.25	33.6875	28.5	26.5
17	26.5	45	29.5	31	16	48.2175	18.25	33.6875	29.5	27.5
18	27.5	46.5	30.25	32	16.5	50.9675	19.25	33.6875	30.5	28.5
19	28.5	48	31	33	17	53.7175	20.25	33.6875	31.5	29.5



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