

# **CATCO** CATALYTIC HEATER COMPANY

## CATALYTIC HEATERS

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### OVERVIEW

Catalytic heaters have been used in industrial applications since they were first introduced several decades ago. Using natural gas or propane, they produce flameless heat with most of the heat generated as radiant, infrared energy. Since the maximum operating temperature is relatively low (always below 900° F),

locations as personnel work areas, hazardous classified areas and equipment storage areas.

### Oven and Process Operations:

Catalytic heaters provide an excellent source of radiant heat for paint curing, powder coating, drying, and other process applications.

### Gas Pre-heating:

Heat exchanger units incorporating catalytic heaters may be used to pre-heat a gas stream, preventing freezing and hydrate formation downstream.

### ADVANTAGES OF CATALYTIC HEAT

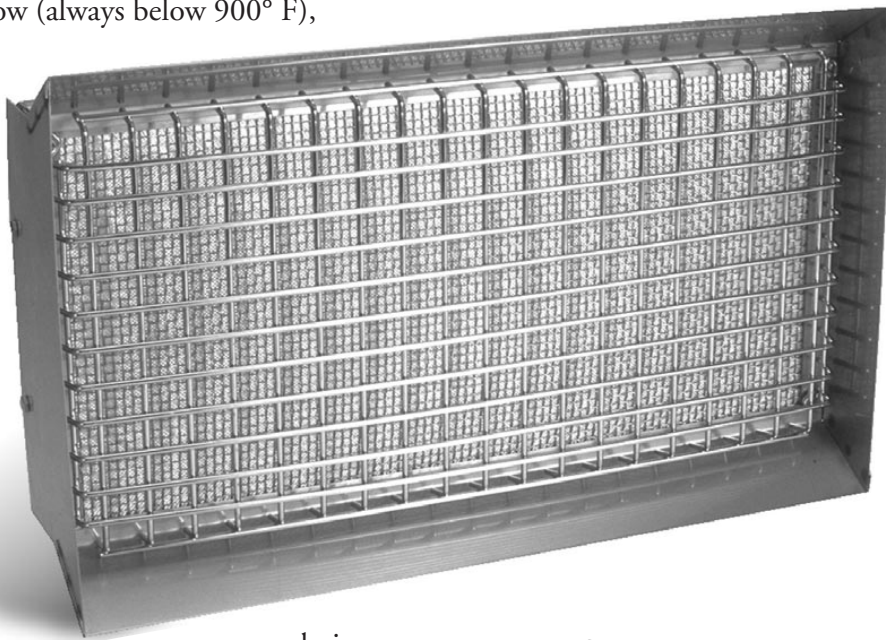
Catalytic heaters have many advantages over other types of heating. The heat produced is in the form of radiant energy and may be directed to the object requiring heat. Only the object is heated and not the surrounding air.

### Simplicity and Durability

Catalytic heaters have no moving parts to wear out. The catalyst is not consumed during the heating process. Heaters will continue to operate indefinitely, with no maintenance, as long as clean fuel is supplied.

### Safety

The surface temperature of the catalytic heater is approximately 700° F, much lower than an open flame (approximately 1300° F, the ignition temperature of natural gas). **CATCO** Catalytic heaters are approved by Factory Mutual and the Canadian Gas Association for operation in hazardous environments. They are a proven, safe substitute for indirect heating applications such as steam tracing and convection heating.



catalytic heaters are ideally suited for use in many hazardous environments.

Since 1982, Catalytic Heater Company has produced **CATCO** catalytic heaters for wide variety of industrial applications. Some of these applications include:

### Space Heating:

Catalytic heaters produce very efficient infrared heat for such

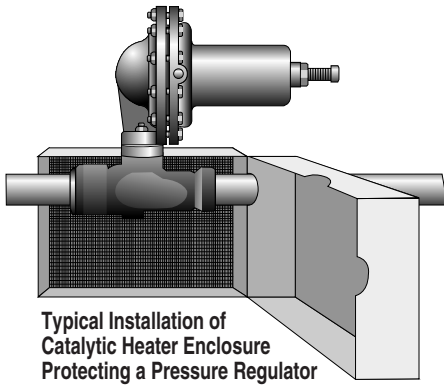
### Natural Gas

### Regulation and Measurement:

Catalytic heaters are used to prevent freezing and hydrate formation, problems common in regulation and measurement equipment when gas pressures fluctuate. In these applications catalytic heaters are usually mounted to direct radiant heat directly at the problem area. There are **CATCO** enclosures available to mount heaters onto any valve or regulator.

**Ease of Installation**

Installation is limited to connecting to a suitable gas supply. Heaters may be started using either DC or AC power, making them ideal heating sources for remote locations where electrical power is limited or not available. For natural gas fired heaters, fuel gas is usually readily available on site.



**PRINCIPLES OF OPERATION**

**Best protection in hazardous areas where heat is required without flame**

Simply stated, catalytic heating is brought about by using a catalyst to promote the reaction of combustible gasses with oxygen or air, at a much

slower rate, to produce heat without flame. When the temperature of the catalyst pad is elevated to 250 F° the combustible gas will burn at a temperature in the range of 600 - 800 F° (Table 1). This is far below the 1200 - 1300 F° ignition point of natural gas. The result is a flameless heat that can be safely put to use in areas where hazards due to explosive vapors may exist. A catalytic heater can operate efficiently on low cost natural gas, propane or butane.

Catalytic heaters produce radiant heat which can be focused on a particular area or object. Radiant heat, like light, is electromagnetic wave energy and travels in straight lines at 186,000 miles per second. Like light energy it can cast shadows, be transmitted, absorbed or reflected by matter, and be focused or dispersed by lenses or prisms of the proper material.

The intensity of heat energy varies with the square of the distance as does light. It will travel any distance without loss as long as it does not contact matter which absorbs it.

The absorption of radiant energy by various materials is a specific property

**Comparative Energy Heat Absorption**  
(4 - 7 MICRONS)

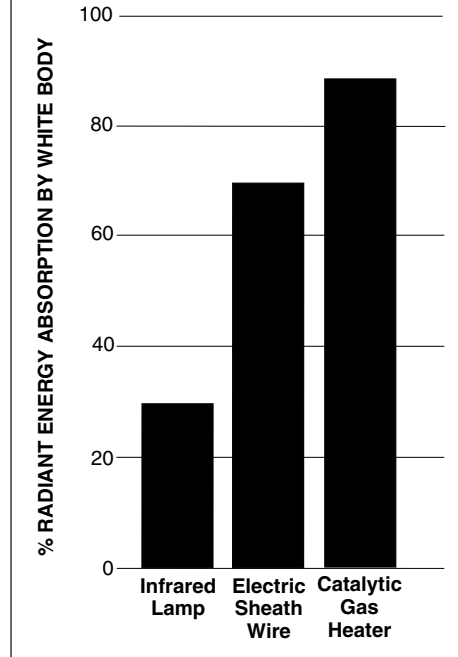


Table 2

of each material. Thus, each molecular substance has an infrared absorption spectrum that is a fingerprint of that substance. Since the absorption of radiant heat is highly selective, there are opportunities for a wide variety of applications in industry.

In addition, the infrared energy emitted by catalytic heaters is in the lower end of the spectrum which means that nearly all of the energy produced is in the form of usable heat (Table 2). Because of these characteristics, catalytic heaters are highly effective when heating specific objects such as valves and regulators.

While other forms of heat often waste energy by heating the surrounding air and other objects in the vicinity, catalytic heaters heat only the objects they are directed at. Obviously, this provides greater efficiency, allowing smaller heaters to be used, lowering initial cost and fuel consumption.

**Comparative Ignition Temperatures**  
(OPEN FLAME VS. CATALYTIC HEAT)

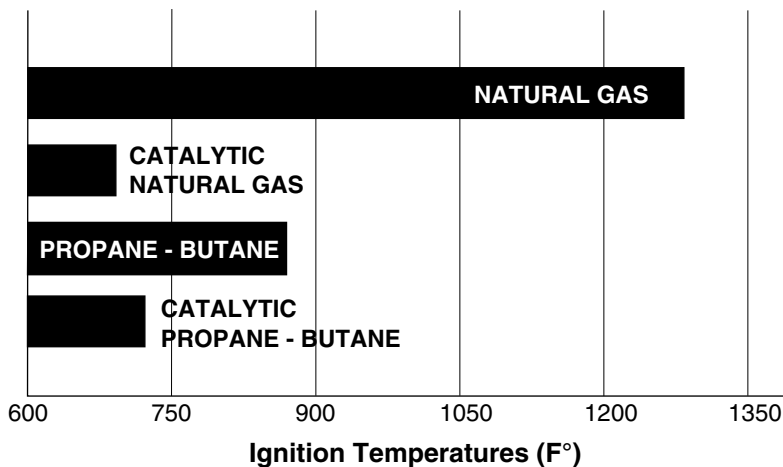


Table 1



# Other Catalytic Heater Company Products & Services

## CATCO PARTS AND ACCESSORIES FOR CATALYTIC HEATERS

- Temperature Controls
- Regulators
- Manifolds for Dual Heater Enclosures
- Filter Drips
- Reflectors
- Face Grilles
- Mounting Brackets
- Explosion Proof Junction Boxes
- Electrical Power Cables (Pigtails)

### CATCO REMANUFACTURING SERVICES FOR CATALYTIC HEATERS

Catalytic heaters of any brand are remanufactured to like-new condition and tested to original performance standards.

### CATCO FLAMELESS GAS PRE-HEATERS

Gas pre-heaters heat a stream of gas to desired temperature before it moves downstream to pressure regulation, fuel gas supply, pneumatic supply, or instrumentation equipment.

## CATCO ENCLOSURES FOR CATALYTIC HEATERS

CATCO manufactures heavy duty enclosures for mounting catalytic heaters onto regulators, valves, pipes, etc. Enclosures are available from stock or can be custom made in a variety of metals to fit any application.

### CATCO PRECISION SHEET METAL MANUFACTURING

Custom sheet metal manufacturing is available for short and medium runs. Materials up to 14 gauge stainless steel and 10 gauge steel and 1/4" aluminum can be used to manufacture in tolerances to .015".

## Catalytic Heater Company Model Identification

| STD  | 1212 | S | 1 | G |
|--|------|---|---|---|
| <p>G = Natural gas fuel<br/>L = LPG fuel</p>   |      |   |   |   |
| <p>1 = 12V starting element<br/>2 = 120V starting element<br/>3 = 240V starting element</p>  |      |   |   |   |
| <p>S = Stainless steel case<br/>C = Cold rolled painted steel case</p>   |      |   |   |   |
| <p>Dimension (width X length) or diameter in inches</p>  |      |   |   |   |
| <p>STD = Standard heater<br/>SFT = Same as Standard but includes thermocouple, and safety valve.<br/>CGA = Same as Standard but includes thermocouple, safety valve, and low pressure regulator.</p> |      |   |   |   |

YOUR **CATALYTIC HEATER COMPANY** REPRESENTATIVE