Heating Safely with Gas-Fired Infrared Heaters

Infrared heating systems have a long history of safe use in a wide variety of commercial and industrial applications. Safety should be a top priority of the design and installation phases.

Making a Difference

A safe and effective infrared application represents the collective efforts of many industry professionals. Let's explore the roles of the following trades and their typical duties in providing or using an infrared heater.

The Manufacturer is legally responsible for the construction of a "reasonably safe" appliance. Most manufacturers will have their products certified to a national standard which validates performance and safety design aspects. Premier manufacturers will utilize strict quality control measures and provide clear warnings and instructions.

The Specifying Engineer is responsible for the design of the system within the building environment. Many engineers will research the manufacturing community and specify the best available products. Engineers will conduct the heat loss calculations and place product in a manner that will provide satisfactory heat patterns, comply with any codes and avoid any hazards.

The Contractor is the professional party or parties responsible for the installation of the equipment. A mechanical contractor will often hang, pipe, and vent the appliance according to the local codes and the manufacturer's instructions which they should be quite knowledgeable of.

The Distributor is sometimes known as a manufacturer's representative or as a wholesaler. The distributor is often factory trained and provides a great resource for specific application concerns or guidance. Premier distributors will provide technical support, conduct surveys, stock product and replacement parts and be associated with supporting regional associations.

The Inspector is found in many parts of the country and is responsible for the review and approval of the installation prior to initial operation and issuance of approval certificates. A good inspector will possess a basic knowledge of the product operation, the key hazards and the local codes. Some inspectors will proactively locate and utilize other knowledge resources in the pursuit of a safe and quality installation.

The End User, or the customer, is the party who will utilize the product in their space. The end user should acquaint themselves with the owners manual and use and maintain their product as instructed. The end user should pay particular attention to the clearances to combustibles and conduct an annual maintenance review.

Infrared Heater Safety Council (IRSC)

The Infrared Heater Safety Council represents a gathering of the leading manufacturers of gas-fired infrared heaters with a stated purpose of educating the public on the safe use of our products.

To learn more about the IRSC, please visit www.irsafetycouncil.org. A brochure highlighting information on the proper use of infrared heaters, clearance factors and proper ventilation is available on this web site.

Codes

Designers and installers of gas-fired infrared heating systems should be familiar with local codes and the National Fuel Gas Code (NFPA-54) ANSI Z223.1, which is continually updated to maintain safe use of gas appliances in applications.

Are you Aware…

…that some manufacturers provide an extensive online AutoCad library with product and detailed installation depictions? Using this resource will allow the conveyance of clear instructions to the field.

Clearance Considerations

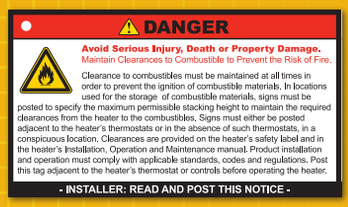
- Canvas
- Combustible materials
- Flammable liquids
- Insulated ceilings
- Paper products
- Racking
- Wiring in conduit
- Wood

Operational Considerations

- Car wash equipment
- Hoses
- Overhead cranes
- Overhead doors
- Parked vehicles
- Sprinkler systems
- Vehicle lifts

Did You Know?

Detroit Radiant Products Co. provides a mylar safety tag with each heater to assist the installer in complying with the NFPA-54 Standard.


DANGER

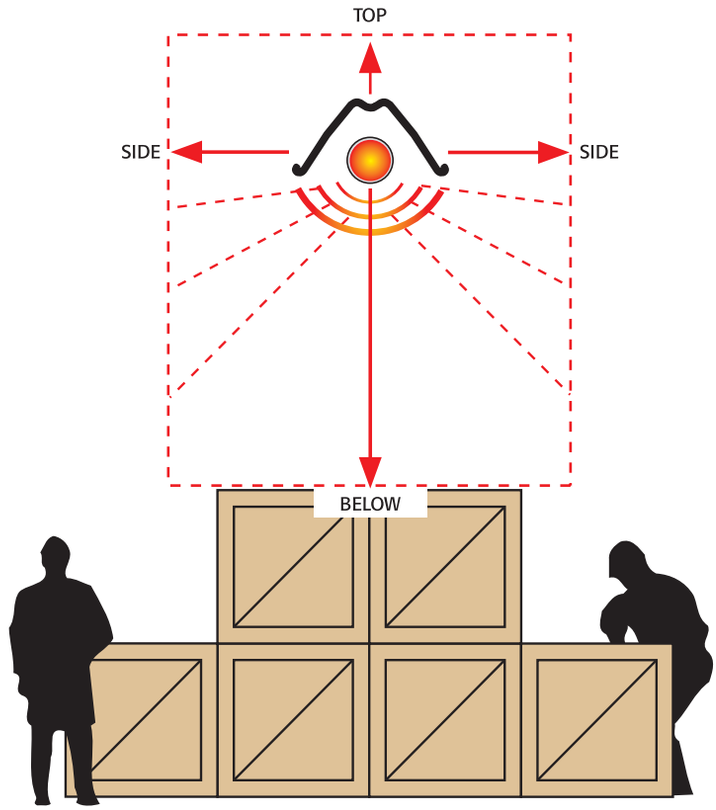
Avoid Serious Injury, Death or Property Damage.
Maintain Clearances to Combustible to Prevent the Risk of Fire.

Clearance to combustibles must be maintained at all times in order to prevent the ignition of combustible materials. In locations used for the storage of combustible materials, signs must be posted to specify the maximum permissible stacking height to maintain the required clearances from the heater to the combustibles. Signs must either be posted adjacent to the heater's thermostats or in the absence of such thermostats, in a conspicuous location. Clearances are provided on the heater's safety label and in the heater's Installation, Operation and Maintenance manual. Product installation and operation must comply with applicable standards, codes and regulations. Post this tag adjacent to the heater's thermostat or controls before operating the heater.

- INSTALLER: READ AND POST THIS NOTICE -

Clearance to Combustibles

Clearance to combustibles, or the required distance for safe operation, are common with many space heating products. Combustibles are materials which may catch on fire and include common items such as wood, paper, rubber and fabric. Clearances to combustibles distances are prominently displayed on the product and **must** be maintained at all times to ensure safety.



Responsibility of the Installer and Users

Ensure that building materials with a low heat tolerance are protected to prevent degradation.

"...in locations used for storage of combustible materials, signs shall be posted to specify the maximum permissible stacking height to the combustibles."
This is quoted from the National Fuel Gas Code (ANSI Z223.1), and the Standard for Gas-Fired Low-Intensity Infrared Heaters (ANSI Z83.20)

ANSI Z83.20 further states "...and such signs must either be posted adjacent to the heat thermostat or in the absence of such thermostat in a conspicuous location."

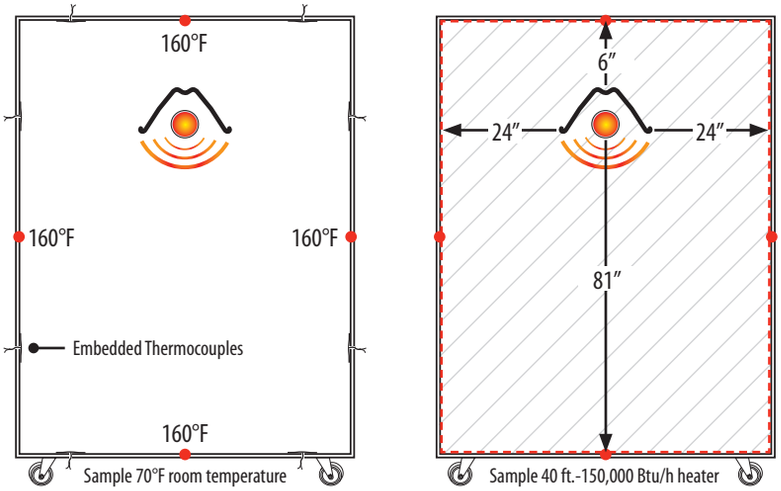
How Clearances to Combustibles are Derived

ANSI Standards govern the method by which clearances to combustibles are derived. A low intensity tubular heater will undergo the following steps during its certification process:

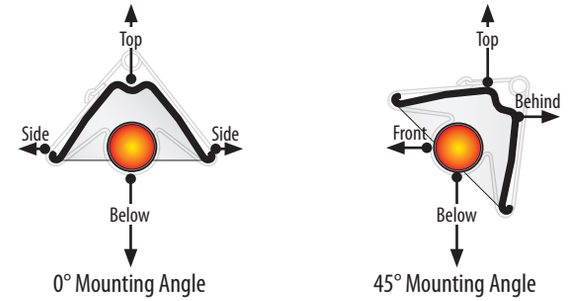
1. Identify the hot zone on the heater.

2. Place the hottest portion of the heater into a test apparatus and identify the registered temperatures with the goal of finding a 90°F temperature rise. Record the distance.

Black Board Test Apparatus

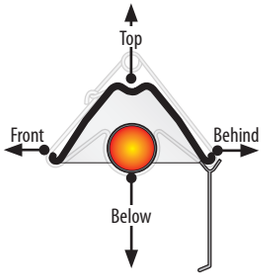


3. Perform tests at a 0° and 45° mounting angles and any other configuration desired by the manufacturer. Display data on product and in the installation, operation, maintenance and parts manual.

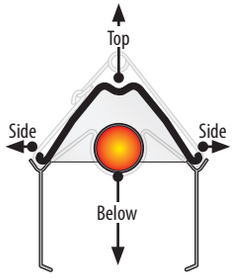


0° Mounting Angle

45° Mounting Angle



0° Mounting Angle with Side Shield



0° Mounting Angle with Side Shields

Did You Know?

Detroit Radiant Products Co. provides clearance to combustibles data for its tube heaters at a 20-ft. mark downstream of the burner. This allows for added flexibility in the design and application of the heating system.

The European Standard for testing clearances allows for a 117°F temperature rise and therefore a small clearance to combustible envelope.

Read, Understand and Follow These Guidelines:

- Keep gasoline or other combustible material including flammable objects, liquids, dust or vapors away from the heater or any other appliance.
- Maintain clearances from heat sensitive material, equipment and workstations.
- Maintain clearance from heat sensing devices, such as sprinkler systems, and make sure these devices are not overheated.
- Maintain clearances from swinging and overhead doors, overhead cranes, vehicle lifts, partitions, storage racks, building construction, etc.
- Hang heater in accordance with the suspension requirements.
- Do not run gas pipe or conduit in the area of exhaust products or in the clearance zone.

Gas Connection

- When connecting an infrared heater to the supply line, allowances for expansion are required.
- A flexible connector of approved type **must** be used.
- The gas piping system shall not bear any weight of any appliance.
- Gas conversions must be done by a qualified person or agency following the manufacturer's conversion instructions.
- Reference NFPA 54/ANSI Z223.1 National Fuel Gas Code, latest revision.

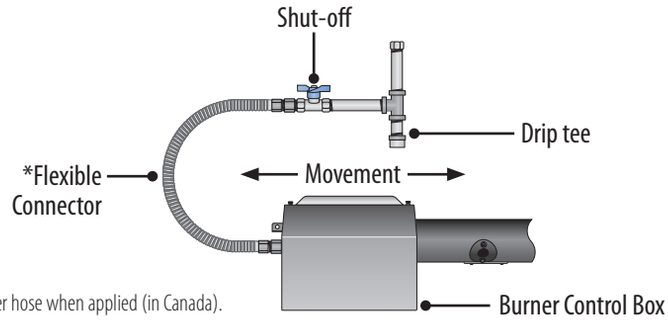
Ventilation

- Provide proper fire guarding (thimbles, flashing, etc.) when venting through a combustible wall.
- Provide mechanical or natural ventilation of 4 CFM/1,000 BTU/hr (0.38 m3/min/kW) of input when operating unvented.
- Provide fresh air for combustion when operating in harsh environments.
- Use a single control when common venting multiple units.
- Provide adequate separation from the heater to the air intake.
- Verify vent line(s) are free of obstructions and debris.
- Use approved sidewall vent caps as specified by the manufacturer.

Other Considerations

Proper Gas Connection

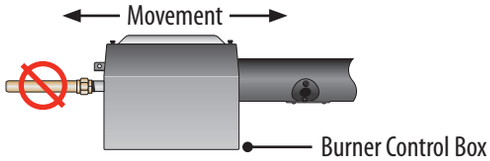
Connect a heater to the gas supply using proper equipment as set forth by ANSI, NFPA and the manufacturer.



*Rubber hose when applied (in Canada).

Improper Gas Connection

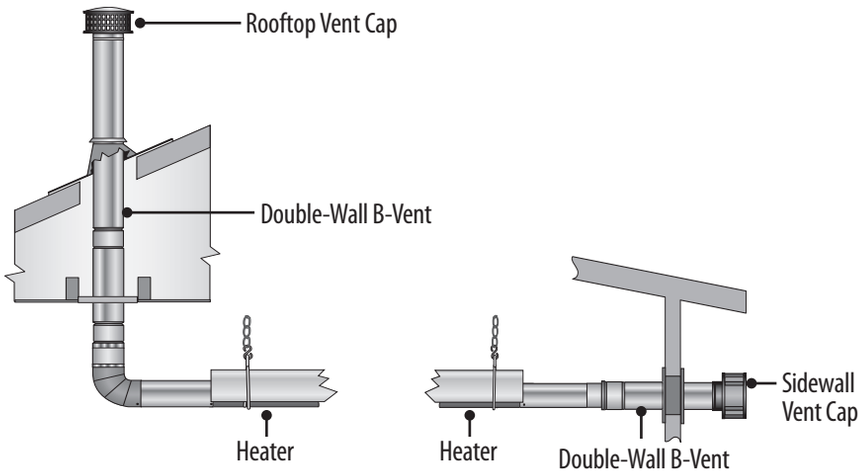
Never connect the gas supply line directly to the heater inlet. **Never** use copper piping to connect unit to the gas supply.



Failure to properly connect the gas supply to the unit may result in leaks, improper heater operation and possible system failure including explosion or fire.

Proper Ventilation

Heaters must be vented per all applicable codes. All infrared heating manufacturers provide a variety of vent terminations and piping.



For specific ventilation requirements, reference the manufacturer's Installation, Operation and Maintenance manual.