

# Talking to Residential Building Occupants about Unvented Gas Space Heating

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# Overview

- Unvented gas appliances (UGAs) still a **flash point** topic
- The EPA and the home performance industry continue to be **polarized** against manufacturers over health and safety risks
- A clear distinction must be made between pre- and post- 1980 UGAs – they are two different animals
- Purchases for residential use have been on the rise – now an estimated total of **17 million units** in use
- Consumers receive **conflicting information** about correct usage and applications for UGAs from vendors, health and safety bodies
- Field staff communication with residential occupants who operate UGAs must account for range of conflicting information consumer hears and the **occupant's own perceptions** about the risks posed
  - without sowing undue panic
  - and by helping your clients make sense of information and advice about the potential hazards

**Effective communication** with clients requires an understanding of their perceptions and knowledge about - as well as **motivation** for using - an unvented gas appliance

## What consumers hear from manufacturers

### Empire BF-30-L 30,000 BTU

#### Item Features

- Convenient, **easy-to-operate** controls on the top of unit
- Push-button ignitor lights the pilot, eliminates need for **matches**
- Test-fired in the factory
- Oxygen-Depletion Sensor **shuts off the unit** if there is not enough available **fresh air**
- **Quiet** as a whisper
- **Durable**, scratch-resistant finish
- Of all heating sources available, gas heats an area **cleanly, efficiently**, and for **less than half the cost** of electricity. Gas heat also continues to function in the event of a **power outage**



## What frequently visited advice websites say

### About.com

You might wonder how a fireplace can be safely used without venting its wastes to the outside.

Unvented gas logs are designed to produce a very **hot flame** that results in **nearly complete fuel combustion**, decreasing the levels of carbon monoxide and soot that are produced by other gas logs.

Unvented gas logs are always equipped with an Oxygen Depletion Sensor (ODS), which is **designed to turn off the gas before carbon monoxide reaches a dangerous level** in the room.

It's a good idea to install one or more carbon monoxide detectors in your home, no matter what type of fuel-burning appliance you have.

**Detectors** are an inexpensive way to **put your mind at ease** about carbon monoxide levels.



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### Bottom Line: Vent-Free Gas Appliances – Know the Facts

By Mary S. Carson  
February 2007

Did you know:

- Vent-free supplemental natural gas or propane fueled heaters are allowed in bedrooms and bathrooms in most areas of the U.S.
- Vent-free units have no restrictions relative to sleeping in a room with a vent-free appliance
- Vent-free units do not require an open window
- There are no CO incidents reported by the CPSC from an ODS-equipped vent-free appliance
- Vent-free natural gas or propane fueled appliances are allowed in 49 states
- Vent-free units are now allowed in every major code in the U.S.

Since 1980, more than seventeen and one-half million American homes in 49 states have relied on vent-free gas space heaters, fireplaces, logs, inserts, and stoves for supplemental home heating. Vent-free products range from 5,000 to 40,000 Btu – including 8,000 to 10,000 Btu units for bedrooms and 6,000 Btu units for bathrooms. In most areas of the U.S. vent-free supplemental heaters are allowed in bedrooms as well as bathrooms, as long as they are wall hung, permanently installed and do not exceed the required Btu limit. These are the only restrictions relative to the use of vent-free gas appliances in bedrooms; otherwise, there are no restrictions relative to sleeping in the presence of a vent-free gas product.

In the past year, vent-free gas heaters have been unfairly maligned by a number of syndicated columns picked up by newspapers all over the country. These articles have falsely placed vent-free gas appliances in the same category as kerosene room heaters and they have advised consumers to ventilate these units to the outside and to never sleep in a room with an unvented room heater. With respect to the natural gas and propane fueled vent-free gas appliances, this advice has no basis in fact. A review of the U.S. Consumer Product Safety Commission (CPSC) database that has been tracking these products for 25 years confirms that there has never been a documented poisoning or fatality resulting from CO emissions associated with a vent-free supplemental heating gas product.



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### Preventing Problems with Combustion Equipment

- [Read equipment's home owner manual and instructions.](#) Make sure equipment receives regular professional inspection and maintenance.
- [Avoid installing unvented \(or "vent-free"\) space or water heating appliances.](#)
- When replacing heating equipment, [consider using only sealed-combustion, induced draft, or power-vented furnaces, boilers, and water heaters.](#)
- [Use a properly sized range hood fan](#) if you use a gas range.
- After installation of combustion and/or ventilation equipment, [combustion equipment should be tested to be sure that it functions properly.](#)
- [Vent clothes dryers to the outside.](#)
- [Consider installing a Carbon Monoxide alarm.](#)

**Sufficient amounts of Air:**  
 For bathrooms, ASHRAE 62.99 recommends that you exhaust 25 cubic feet per minute (cfm) with a continuously operating fan, or 50 cfm with a fan that you turn on and off as needed.  
 Note that you might incorporate a bath fan into your overall ventilation strategy.

Combustion appliances are those which burn fuels for warmth, cooking, or decorative purposes. Typical fuels are gas, both natural and liquefied petroleum (LP); kerosene; oil; coal; and wood. Examples include space heaters, ranges, furnaces, fireplaces, water heaters, and clothes dryers. These appliances are usually safe. However, under certain conditions (see below), these appliances can release harmful or deadly combustion pollutants into the home (commonly called *combustion spillage* or *backdrafting*). In addition, unvented or improperly vented appliances can add large amounts of moisture to the air, potentially resulting in both biological growth, and damage to the house. Proper selection, installation, inspection, and maintenance of combustion appliances are extremely important. Providing good ventilation can also reduce exposure to combustion pollutants.

Things to consider when remodeling your home are listed below. For a more complete discussion of combustion appliances, see the following publications:

- EPA's [What You Should Know About Combustion Appliances](#)
- The Department of Energy's Technology Fact Sheet "[Combustion Equipment Safety](#)" which provides a more detailed explanation along with installation recommendations.

**Read equipment's home owner manual and instructions.** Make sure equipment receives regular professional inspection and maintenance.

It is important that you understand how to properly operate combustion equipment in your homes, and that you follow the manufacturer's recommendations for maintaining the equipment. Have your combustion appliances--and your chimney--regularly inspected and maintained to reduce your exposure to pollutants. Appliances that are not working properly can release harmful and even fatal amounts of pollutants, especially carbon monoxide, into the living space.

**Avoid installing unvented (or "vent-free") space or water heating appliances.**

Unvented appliances leave all combustion products in the house. Even if incomplete combustion pollutants such as carbon monoxide (CO) are kept to a minimum, these appliances can generate large amounts of moisture which can create its own problems. Unvented heaters require special precautions.

**When replacing heating equipment,** consider using only sealed-combustion, induced draft, or power-vented furnaces, boilers, and water heaters.

Traditionally, combustion equipment relied on natural draft, the tendency for the warm combustion air to rise up a chimney. Today's more efficient equipment does not waste as much energy or send as much heat up the chimney, weakening natural draft. Natural draft can at times be overcome by conditions that depressurize the house, leading to spillage, backdrafting, and the problems associated with combustion products in the house.

ENERGY STAR equipment usually features sealed combustion or power-venting. The risk of backdrafting is lower with these types of equipment than for those relying on natural draft.

**Unvented Space Heaters**  
 Take special precautions when operating unvented fuel-burning space heaters.  
 Consider the potential indoor air pollution effects if you use an

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The EPA concludes that, if you cannot avoid using an unvented gas or kerosene space heater... **keep doors** to the rest of the house **open**, **crack a window** to ensure enough air for ventilation, and **don't sleep** in any room with an unvented gas or kerosene space heater

# Making sense of it all

- Purpose of this presentation *not* to prove or disprove VF-GAMA or EPA, but to think about strategies for talking to occupants about UGAs
- In the maelstrom of information out there, what do we really know?
- The advertised safety claims of post-1908s UGAs (near-complete combustion and minimal concentrations of harmful by-products) depend on:
  - no error in installation
  - no change in burners once unit is installed
  - no change in regulator or fuel mix
  - no product design or manufacturing flaw
  - adequate maintenance
  - correct occupant usage

*...which we find all day long in the field :-)*

# Adding to the mix: Occupant operation

## Trends we see in the field:

- Predominance of pre-1980 UGAs

*especially in low-income households, many of which with occupants more vulnerable to by-product concentrations, including small children and seniors*

- Use of UGAs as a primary heat source
- Long operation times, especially in senior households with desired room temperatures of 85° and up
- Portable UGAs located near combustible material
- Infrequent maintenance

- **Windows closed in UGA combustion zone**

- **Doors closed in UGA combustion zone**

- **UGAs in bedrooms**

***NOTE: There's no controversy here...***



***Nobody supports these types of operation***



***This is where the disagreement begins***

# Adding to the mix: Common client perceptions

- cheaper to buy
- cheaper to install
- cheaper to operate
- can heat just the space I want



***key issues for low-income households***

- easier to install
  - no penetration of building shell

- must be fairly safe since:

- UGAs are 99% efficient

*"So, I only have to worry about 1% of the gas causing harm, right?"*

- State law allows my hardware store to sell them
- UGAs have a lot of safety features, so as long as I install a CO detector, I'll be ok

## Kaleidoscope! Where does this all leaves us?

- U.S. Consumer Product Safety Commission (CPSC) position and focus on UGAs changed significantly since 1980, focusing more on fire risk than CO:
  - **1978** - CPSC proposed a total ban on unvented gas space heaters
  - **1980** - UGAs were the primary cause of 40 CO-related deaths annually
  - **2003** - Space heaters were the primary cause of approximately 11,000 residential fires and 190 fire-related deaths annually
  - **2004** – Of the 150 heating system-related CO deaths, no differentiation between vented and unvented appliances. This reporting method continues today
- But, since the jury is still out on a definitive conclusion about risks today...
- And, since many of the pre-1980 UGAs are still in commission...
  - particularly in low-income households served by Weatherization and other community service agencies (which frequently produce ambient CO test readings in excess of 200ppm)...

## Developing a UGA Client Communication Strategy

- Design and conduct a training session for field staff on UGA communication issues. Make sure your staff are on the same page.
- Help field staff understand current research data, advisories, *sources* of UGA information and their biases
- Review your company's field combustion testing protocol for UGAs, develop a role play for training field staff on how to communicate the meaning of the test results to occupants in non-technical terms
- Follow basic rules for effective occupant education:
  - Avoid jargon and acronyms
  - Use a clear, visual aid to illustrate the health symptoms of combustion by-products at high and low-level concentrations.
  - Train staff to conduct a quick but targeted client interview to determine any suspected NO<sub>2</sub>, CO-related health effects in the household
  - Engage occupant in a discussion to determine his/her knowledge, usage of, and motivations for using a UGA
- Consider the occupant's susceptibility to health risks (age, how UGA is used)
- **Avoid alarmism but always make safety the trump card**