COMBUSTION SAFETY: WHY BE CONCERNED?

According to the CDC: 16,477 people died from CO poisoning from 1999 through 2004.

Homes Tested by Therma-View Infrared & Energy Consultants and Pure Energy Coach:

- 80% of the houses have gas leaks
- 60% of houses with natural draft water heaters & 80% AFUE furnaces have draft issues
- 50% of orphaned water heaters fail or will fail draft at completion of energy retrofits work
- 40% of ovens produce high amounts of CO
- 10% of combustion appliances have dangerous levels of CO

Glossary of Terms

**Backdrafting:** Continuous spillage of combustion flue gases from the combustion appliance.

**Spillage:** Temporary flow of combustion gases from a dilution device of a combustion appliance.

**Flame roll-out:** A fire that burns outside the appliance in open combustion appliances such as atmospheric draft furnaces and water heaters.

**Atmospheric Draft appliance:** An appliance that requires the hot gasses and bi-products from combustion process to vent to the exterior and to pull combustion air into the burner. Draft hood open to the CAZ. Can be easily overcome by air suction on the CAZ.

**Draft diverter:** Part of the combustion vent system commonly found on atmospheric appliances. The diverter is part of the vent system and is open to the combustion appliance zone or area (the house). The diverter is used to maintain a constant pressure in the combustion chamber and assist the draft of the appliance.

**Negative pressures in the combustion zone can result in backdrafting the combustion gasses into the home.**

**Causes of Negative house pressure:**

- Air sealing a home
- Not properly air sealing a home
- Dryers
- Range hoods
- Bath exhaust fans
- Attic fans
- Whole house fans
- Duct leaks
- Large openings from the combustion zone to the attic such as plumbing chases, open top interior wall cavities, chimney chases
Visual Indicators of Backdrafting

Testing Draft

- Draft measurement used to determine how well a chimney is exhausting combustion gasses.
- Standards for acceptable draft pressures are based on fuel type, appliance type, and outdoor temperature.

Smoke stick at draft diverter
(no spillage after 1 minute of operation)

Your hands or a mirror
If backdrafting, you’ll feel moisture or see fogging on a mirror

CAZ Depressurization Set-Up and Combustion Safety Tests
Typical Safety Performance Tests Under Worst Case Conditions

- Put the building in a heating season condition: Close all windows and exterior doors. Open all interior doors.
- Measure the pressure in the CAZ with reference to the outside.
- Turn on all exhaust devices that exhaust to the outside, including the clothes dryer, bath fans, central vacs, and attic fans.
- Turn on the furnace fan by activating the summer switch, or by setting the "fan on" switch on the thermostat. Test CAZ pressure with reference to the outdoors with the fan on and off. Record the higher number and set the fan in that position.
- With the house, door position, and air handler fan in the position which creates the most negative pressure in the CAZ:
  - Test the smallest BTU appliance first, such as the domestic water heater. Check for spillage by using your hands, a mirror, or a smoke generating device in the area of the dilution air inlet (draft diverter or draft hood).
  - Time the period when spillage occurs, if any. There should be no spillage after 1 minute of burner operation.
  - After 5 minutes of appliance operation check the draft pressure in the flue above the draft diverter.
  - Test for CO in undiluted flue gasses.

For training on combustion testing and how unbalanced building pressures can cause serious combustion-related problems, email info@PureEnergyCoach.com and Watch our YouTube Video called Pure Energy Coach - Zonal Pressure Diagnostics House http://www.youtube.com/watch?v=Ml9Ro4lZ6kk&feature=plcp