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COMBUSTION SAFETY

Why be concerned?

According to the CDC: 2,631 people died from CO poisoning from 1999 through 2004.

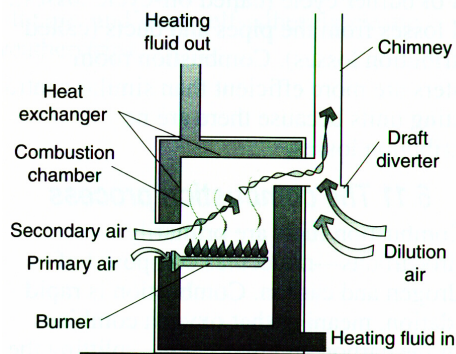
Results of testing done on homes in Syracuse, NY by Therma-View Infrared & Energy Consultants:

- 80% of the houses had 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 shell 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 gasses 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 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.

Open-Combustion, Atmospheric-Draft



Atmospheric-draft heaters use only the buoyancy of the combustion gases and the flame's heat.

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Negative pressures in the combustion zone can result in back drafting the combustion gasses into the home.

Causes of Negative house pressure:

- Air sealing a home
- Dryers
- Range hoods
- Bath exhaust fans
- Large openings from the combustion zone to the attic such as plumbing chases, open top interior wall cavities, chimney chases.

Visual Indicators of Backdrafting



Rust on draft Diverter



Burn marks at combustion chamber

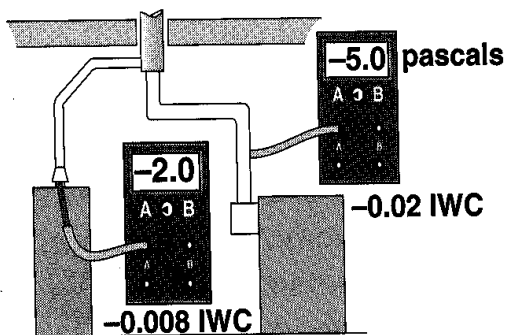
Testing Draft

- Draft measurement used to determine how well a chimney is exhausting combustion gasses.
- Standards for 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
If back drafting you'll feel moisture



Drawing by Saturn Resources Management

Use gauges or a mirror. If mirror fogs, backdrafting is occurring.

Chimney Safety Performance Test Under Worst Case Conditions

- Put the building in a heating season condition
- Close all windows and exterior doors
- Open all interior doors
- Turn on all exhaust devices (if any) including the clothes dryer, bath fans, etc.
- Turn on the furnace fan by activating the summer switch , if one exists.
- Test the smallest BTU appliance first, such as the domestic water heater.
- Turn on the furnace and check for spillage by using your hands 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.