



Interpretations, Clarifications and Guidance

RE: TECHNICAL STANDARDS FOR THE BUILDING ANALYST PROFESSIONAL





BPI Technical Standards
for the Building Analyst Professional
Interpretations, Clarifications and Guidance

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Interpretation Regarding Unvented Appliances

Approved by BPI's Standards Technical Committee – March 2014

Question: Does the reference to unvented combustion appliances in BPI Technical Standards for the Building Analyst Professional, p.14, apply to unvented alcohol-fueled appliances?

Answer: Yes, the reference applies regardless of fuel source.

Interpretation Regarding Monitoring Carbon Monoxide in the Ambient Environment

Approved by BPI's Standards Technical Committee – November 2014

Question: In order to meet the minimum requirements of the standard referenced above, are technicians in the field required to have a dedicated CO monitoring device (independent of any CO monitoring devices used to perform appliance testing) on their person at all times?

Interpretation: Yes. The BPI Building Analyst Professional standard requires that carbon monoxide levels in the ambient air around the technician be monitored throughout all combustion safety tests (CST). In order to do this, the technician needs two separate devices: the combustion analyzer and a dedicated ambient CO monitor. (If the technician is using only the combustion analyzer, it is not measuring the ambient air when it is in the flue.)

Additionally, while the BA standard only specifies continuous ambient CO monitoring during the CST, best practice would be to monitor ambient CO levels at all times *while in the work environment*.

Question: If a dedicated device is required, would any device measuring ambient CO levels suffice?

Interpretation: Any device measuring ambient CO levels would suffice as long as it is dedicated for ambient CO monitoring only and is operated in accordance with manufacturer's specifications.



Clarification: Definition and Reclassification of an Orphaned Natural Draft Water Heater Converted to a Stand-Alone Natural Draft Water Heater

December 2011

A natural draft water heater is typically the weakest drafting combustion appliance in homes. The term “orphaned” water heater was coined to identify those water heaters that once shared a chimney with another combustion appliance – usually a furnace that has since been replaced by a sealed combustion or direct vent heating system. When the water heater is left vented into the chimney alone, it is considered “orphaned.” In this situation, the chimney was originally sized to accommodate the BTU heat input of both the heating system and the water heater. When the only heating appliance still vented into the chimney is the natural draft water heater, the chimney is often oversized for the BTU heat input of the natural draft water heater, reducing its ability to provide sufficient draft for the appliance.

The following definitions are provided as an informative clarification to BPI’s existing standards:

- A natural draft water heater vented into an oversized chimney is considered an **orphaned natural draft water heater**. Building Performance Institute (BPI) Building Analyst Professional Standards define the Combustion Appliance Zone (CAZ) depressurization limit for an orphaned natural draft water heater as -2 Pa.
- A natural draft water heater vented into a properly-sized chimney in accordance with NFPA 31 for oil-fired units, NFPA 54 for gas-fired units, NFPA 58 for propane-fired units and NFPA 211 for solid-fueled units or the venting tables of a chimney liner manufacturer is considered a **stand-alone natural draft water heater**.

An **orphaned natural draft water heater** can be reclassified as a **stand-alone natural draft water heater** if a chimney liner properly sized for the BTU input of the natural draft water heater is installed to improve the draft of the appliance. The chimney liner must comply with NFPA 31, 54, 58 and 211 or the venting tables of the chimney liner manufacturer. Under this new classification, a stand-alone natural draft water heater is allowed the same CAZ depressurization limit as an individual boiler or furnace (-5 PA).

SUMMARY: The installation of a properly-sized chimney liner changes the classification of an orphaned natural draft water heater to a stand-alone natural draft water heater. This change of classification allows a CAZ depressurization limit of -5 PA for this appliance.



Clarification/Guidance on Combustion Safety Testing of Unspecified Combustion Appliances (Gas Fireplaces and Gas Heating Stoves)

June 2015

1) Gas Fireplaces

- a) If the gas fireplace is a non-sealed combustion type and venting into a conventional chimney (with or without a pre-constructed liner), a spillage test is required. The spillage test could be performed in a traverse-like pattern with a smoke stick directly in front of the fireplace. This test would be performed when the combustion appliance zone (CAZ) is under worst case depressurization¹. Any spillage after one minute is a failure. If spillage occurs under worst case depressurization, spillage testing would then be performed under natural conditions.

Carbon monoxide testing may be difficult or impossible to perform if the technician is unable to place the test probe in the exhaust vent. If a test probe cannot be placed in the exhaust vent, testing ambient air directly in front of and above the fireplace is recommended. Draft testing may also be difficult or impossible to perform if the technician is unable to place the test probe in the exhaust vent. Any corrective action required is stated in *Technical Standards for the Building Analyst Professional* (Building Analyst Standard), page 13. CAZ Depressurization Limits for a natural draft boiler/furnace would apply.

- b) If the gas fireplace is a sealed combustion insert, a spillage test is not required. It is recommended to use smoke directly in front of the unit while operating (any signs of spillage may indicate an issue). Carbon monoxide must be measured at the exterior termination point. If this point is not accessible, measuring ambient carbon monoxide directly in front of and above the unit is recommended. Draft testing may be impossible to perform since there may not be an appropriate location in which to properly place a test probe. Any corrective action required is stated in Building Analyst Standard, page 13. CAZ Depressurization Limits for a sealed combustion appliance would apply.

2) Gas Stoves (Heating Stoves)

- a) If the gas stove is specified for use as a heating appliance, a spillage test is required. This test would be performed under worst case depressurization. Any spillage after one minute is a failure. If spillage occurs under worst case depressurization, spillage testing would then be performed under natural conditions.

If the vent pipe is accessible, carbon monoxide testing within the vent pipe is required. Also, if the vent pipe is accessible, draft testing is required. Any corrective action required is stated in Building Analyst Standard, page 13. CAZ Depressurization Limits for a natural draft boiler/furnace would apply.

3) General information (Combustion Safety Testing)

- a) Building Analyst Standard, page 10, states the following: "With the exception of unvented gas or propane cooking appliances, CO must be tested in all combustion appliances under worst case conditions and normal draft conditions (when the appliance fails under worst-case)."

¹ "Worst case" depressurization refers to the greatest depressurization achievable in the CAZ given the weather/temperature conditions at the time of the inspection.



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- b) Building Analyst Standard, page 14, states the following: “No unvented combustion appliances may operate in the living space with the exception of gas ran ranges/ovens.”
- c) Neither gas fireplaces nor gas stoves (heating stoves) fall into the category of a gas range/oven since both are defined as, and specifically used as, heating sources.
- d) Gas fireplaces and gas stoves, though not specifically referenced in the Building Analyst Standard, do require minimum combustion safety testing.

Interim Guidance on Water Heaters and Marginal Depressurization with No Spillage

October 2012

This information applies to all natural draft water heaters that pass the spillage test under worst case conditions and have passed a visual combustion venting system inspection but are in houses with mechanical room depressurization between -2 and -5 Pascals.

If the combustion appliance zone (CAZ) testing indicates readings in the specified pascal range (between -2 and -5 Pa), remediation is required. In homes where these conditions exist, the following remedies must be included in the work scope. Acceptable remedies are:

- Provide a spill switch to interrupt fuel supply if spillage occurs

or

- Provide a spill alarm on the water heater and install an additional CO alarm in the mechanical room.

Additionally, we recommend, but do not require, power vent and direct vent upgrades or isolation from pressure sources and additional combustion air.

This interim standard only applies to the specified Pascal range (between -2 and -5 Pa) under worst case conditions. If the CAZ depressurization has exceeded this Pascal range, please refer to page 13 of the BPI Building Analyst Professional standard, which states: “When CAZ depressurization limits are exceeded under worst-case conditions according to the CAZ Depressurization Limit table, make up air must be provided or other modifications to the building shell or exhaust appliances must be included in the work scope to bring the depressurization within acceptable limits.”

Please refer to the CAZ Depressurization Limits table on page 14 of BPI Technical Standards for the Building Analyst Professional.

This interim guidance is subject to review in the standards maintenance process.

Questions or comments regarding this interim guidance should be directed to the BPI Standards Dept. at standards@bpi.org.