

Amendment: Combustion Appliance Testing Standards Removal

Proponent:

Brett Dillon, Chair Standards Development Committee

Applies to:

2006 Mortgage Industry National Home Energy Rating Systems Standards, Section 805, 807-808; Section 204.1.5.2.8, Section 204.1.6.2.9, 206.1.36.1,

Proposed Amendment:

805 ~~Work Scope and Combustion Safety Procedures~~

805.1 These protocols contained in ANSI/ACCA 12 QH, Appendix A Sections A4 (Carbon Monoxide Test) and A5 (Depressurization Test for the Combustion Appliance Zone (CAZ)) shall be followed by RESNET-accredited Raters and Auditors (hereinafter referred to collectively as “Auditors”) performing combustion appliance testing ~~or writing work scopes for repairs.~~

805.2 ~~If the Auditor has been trained and certified in accordance with a RESNET approved “equivalent home performance certification program” or the Building Performance Institute (BPI) Standards, the Auditor may follow protocols in accordance with those equivalent standards.~~

805.3 ~~RESNET-accredited Training Providers shall train HERS Auditors on these protocols through either field exercise or through simulated conditions. A written exam administered by a RESNET-accredited Trainer is also required, provided by RESNET. The test shall cover the content of these guidelines with a minimum of 25 questions. A minimum score of 80% is required to pass.~~

805.4- 2 Prior to conducting any test that affects the operating pressures in the home, the Auditor shall inquire whether a person that has environmental sensitivities (asthma, allergies, chemical sensitivity, etc.) is present in the home. If such a person is present, the Auditor shall not perform such tests without written disclosure from the affected party (or responsible adult). The written disclosure shall state (at a minimum) that “during the period of testing, some amount of dust, particles, or soil gases already present in the home may become airborne.” Without a signed disclosure, the Auditor shall either reschedule the test for a time when they will not be present, or ask them to leave the home during the testing process. The Auditor shall also inquire as to the presence of pets that may potentially be affected by testing procedures.

806 Gas Leakage Test

806.1 If there is a noticeable odor indicating gas buildup within the home, the occupants and Auditor shall leave the house and the appropriate authorities and utility providers shall be notified from outside the home.

806.2 The Auditor should use a gas detector upon entry into the home to detect the presence of natural gas. If gas is suspected or confirmed, ensure that switches are not

operated while exiting and no ignition concerns are present. The audit shall not proceed until the proper authorities have deemed it safe to re-enter the home. If there is no noticeable odor indicating gas buildup within the home, the Auditor shall determine if there are gas leaks in the fittings and connections of natural gas appliances within the home and natural gas/liquid propane supply lines following these protocols.

806.3 Inspect all fittings and joints in supply lines and appliance connectors and confirm suspected leaks with leak-detection fluid. Identify for repair or replacement any kinked, corroded or visibly worn flexible gas lines and any flexible connectors manufactured prior to 1974.

806.4 Equipment needed

- Combustible gas detector capable of measuring 20 ppm
- Leak detection fluid (non-corrosive)

~~807 Worst Case Depressurization Test~~

~~This test procedure measures the pressure in the Combustion Appliance Zone (CAZ) and provides visual evidence of spillage potential.~~

~~If there are any vented combustion appliances that use indoor air to vent combustion gases and which are not classified as a category 3 or 4 according to NFPA standard 54, then a worst case depressurization test shall be performed using the following protocol.~~

~~807.1 Check the combustion appliance zone for the presence of flammable or explosive material near a combustion source.~~

~~807.2 Visually inspect venting system for proper size and horizontal pitch and determine there is no blockage or restriction, leakage, corrosion or other deficiencies that could cause an unsafe condition.~~

~~807.2.1 Inspect burners and crossovers for blockage and corrosion.~~

~~807.2.2 Inspect furnace heat exchangers for cracks, openings or excessive corrosion.~~

~~807.3 Close all the exterior doors and windows of the home.~~

~~807.4 Close fireplace damper(s) if fireplace is present.~~

~~807.5 Close any interior doors between the CAZ and the remainder of the house, ensuring that all vented appliances and exhaust fans have been turned off.~~

~~807.6 Measure the baseline pressure difference between the CAZ with respect to (WRT) outside (ambient) and baseline CO levels. Set the gauge to read pressure and record the baseline pressure.~~

~~807.7 Turn on all exhaust fans in the home (kitchen range hood, bath exhaust, clothes dryer, etc.) that exhaust air outside the building envelope.~~

~~807.8 Record pressure in CAZ with respect to Outside.~~

~~807.9 Turn on the air handler. Record pressure in CAZ with respect to outside. If air handler makes the CAZ more positive (or less negative), turn it off. If the air handler is kept on, close interior doors to any rooms that have no return registers.~~

~~807.10 If fireplace is present install blower door and set to exhaust 300 CFM to simulate fireplace in operation.~~

~~807.11 Record net change in pressure difference within the CAZ WRT outside between baseline and worst case depressurization conditions. Record the position of doors and conditions of fans and air handler. When the net change in CAZ pressure is lower (more negative) than the limits specified below, the work scope shall specify remediation through pressure balancing, duct sealing, and/or other pressure-relief measures, as applicable.~~

~~807.12 Turn on vented combustion appliance with the smallest Btu capacity. Operate appliance for 5 minutes then measure CO levels according to the carbon monoxide test procedure below, and check appliance draft using a smoke pencil at the draft diverter. If the smoke is not fully drawn up the flue, the appliance has spillage under worst case depressurization. Record if there is any spillage and record CO level. When spillage occurs or CO exceeds the limits specified below in section 9, the work scope shall specify remediation, including equipment repair or replacement, and/or building pressure remediation, as applicable. If both spillage and high CO are found during the test, the homeowner should be notified of the conditions and that it needs immediate remediation.~~

~~807.13 Turn on all the other combustion appliances, one at a time, within the CAZ and repeat step 1.12 on each of them.~~

~~807.14 If spillage or high CO occurs in any appliance(s) under worst case depressurization, retest that appliance(s) under natural conditions.~~

~~807.14.1 Turn off the combustion appliances.~~

~~807.14.2 Turn off the exhaust fans.~~

~~807.14.3 Open the interior doors.~~

~~807.14.4 Let the vent cool.~~

~~807.14.5 Test CO and spillage under natural conditions. If the test failed under worst-case, but passes under natural conditions, the work scope shall specify building pressure remediation, as applicable.~~

~~807.14.6 If an appliance fails under natural conditions, the Auditor shall inform the homeowner of the problem, and the work scope shall specify remediation, including equipment or vent system repair or replacement, as applicable.~~

~~CAZ Pressure Limits~~

~~-15 Pa for pellet stoves with exhaust fans and sealed vents~~

~~-5 Pa for Atmospheric vented oil or gas system (classified as a category 1 or 2 according to NFPA standard 54, such as oil power burner; fan-assisted or induced-draft gas; solid-fuel burning appliance other than pellet stoves with exhaust fans and sealed vents)~~

~~If ambient CO levels exceed 35 ppm at any time, stop any testing and turn the combustion appliances off. Open all the exterior doors and windows. No one should enter the home until the CO levels drop below 35 ppm. The combustion appliance causing the increase in CO levels must be repaired by a qualified technician prior to completing the combustion appliance tests, unless the work scope calls for replacement of the appliance(s).~~

~~808 Carbon Monoxide Testing~~

~~Test all spaces (including attached garages, crawlspaces, basements) containing combustion appliances for carbon monoxide using the following protocols.~~

~~808.1 CO testing of ambient air shall be performed continuously while performing a Worst Case Depressurization Test and/or under natural conditions, as required by paragraph 807.14.~~

~~808.2 Equipment used shall:~~

- ~~• Be capable of measuring carbon monoxide (CO) levels from 0 to 2,000 ppm (parts per million)~~
- ~~• Have a resolution of 1 ppm~~
- ~~• Have an accuracy rate of + 5 ppm~~

~~• Be calibrated annually by the manufacturer (or using manufacturer's instructions) and evidence of the calibration shall be submitted to the Rating Provider Quality Assurance Designee~~

~~808.3 Zero the carbon monoxide meter outside the building away from any combustion outlets or automobile traffic areas.~~

~~808.4 Take a measurement of CO levels within the home upon entering to establish a baseline. Do not measure near combustion appliances while they are operating. If ambient CO levels are higher than 35 ppm during normal appliance operation, turn off the appliance, ventilate the space, and evacuate the building. The building may be reentered once ambient CO levels have gone below 35 ppm.~~

~~808.5 For atmospherically-vented appliances:~~

~~808.5.1 Take a measurement of vent gases upstream of (before they reach) the draft diverter.~~

~~808.5.2 Appliance must operate for at least 5 minutes before taking sample.~~

~~808.5.3 Take sample during worst-case depressurization test and/or under natural conditions, as required by paragraph 1.14. Record the CO level.~~

~~808.6 For direct- or power-vented appliances:~~

~~808.6.1 Sample must be taken at vent termination.~~

~~808.6.2 Appliance must operate for at least 5 minutes before taking sample.~~

~~808.6.3 Take sample during worst-case depressurization test and/or under natural conditions, as required by paragraph 1.14. Record the CO level.~~

~~808.7 For LP- or natural gas ovens:~~

~~808.7.1 Open a window or door to the outside.~~

~~808.7.2 Remove any foil or cooking utensils within the oven.~~

~~808.7.3 Verify that the oven is not in self-cleaning mode.~~

~~808.7.4 Turn oven on to highest temperature setting.~~

~~808.7.5 Close the oven door and begin monitoring the CO levels in the kitchen, 5 feet from the oven at countertop height. Record CO levels.~~

~~808.7.6 Measure the CO levels within the oven vent.~~

~~808.7.6.1 Samples must be taken while burner is firing.~~

~~808.7.6.2 Operate burner for at least 5 minutes while sampling flue gases.~~

~~808.7.6.3 If CO levels are higher than 100 ppm, repeat the flue gas sampling until the CO levels stop falling.~~

~~808.7.6.4 Record the steady state CO reading in ppm and turn off oven.~~

~~808.8 If measured CO levels are higher than 100 ppm (200 for oven), or an appliance fails to meet manufacturer's specifications for CO production (whichever is higher), the work scope shall specify replacement or repair of the appliance, and the homeowner shall be notified of the need for service by a qualified technician.~~

~~808.9 If ambient CO levels exceed 35 ppm at any time, stop any testing and turn the combustion appliances off. Open all the exterior doors and windows. No one should enter the home until the CO levels drop below 35 ppm. The combustion appliance causing the increase in CO levels must be repaired by a qualified technician prior to completing the combustion appliance tests, unless the work scope calls for replacement of the appliance(s).~~

~~204.1.5.2.8 Use combustion gas sensing equipment and recommend methods of fixing leaks. Perform CAZ, spillage, and CO testing in accordance with Carbon Monoxide (CO) Test and Worst-Case-Depressurization and Combustion Appliance Testing Test for the Combustion Appliance Zone (CAZ) protocols contained in ~~Chapter 8: ANSI/ACCA 12 QH, Appendix A, Sections A4 and A5.~~~~

~~204.1.6.2.9 Perform CAZ, spillage, and CO testing in accordance with Carbon Monoxide (CO) Test and Worst-Case-Depressurization and Combustion Appliance Testing Test for the Combustion Appliance Zone (CAZ) protocols contained in ~~Chapter 8: ANSI/ACCA 12 QH, Appendix A, Sections A4 and A5.~~~~

~~206.1.36.1 Perform worst-case-CAZ depressurization, spillage, and CO testing.~~
ADDENDUM 2

~~Keep Section 806 (Gas Leakage Testing).~~

~~Strike Sections 807-808 (CO testing and CAZ Depressurization Testing).~~

Background/Rationale:

I am concerned that continuing down this path of developing and improving CAZ standards has put us in a no-win situation. From a strategic perspective, this particular field has many competitive players, “standards”, and protocols; CAZ testing is not a minimum rated feature of the home and has no impact on the HERS Index; I feel we are competing in an arena in which we cannot possibly win- no matter what we do, we are excoriated on all fronts by the many organizations who are powerful and have competing interests. This has proven to be a serious drain on our resources, both from staff and volunteers.

I think we should stop and ask why we are engaged in this, especially since ANSI/ACCA 12 QH, Appendix A already has a CO testing and CAZ depressurization test protocol. It is never too late to admit we may have made a mistake in heading down this path and extricate ourselves from this particular political nightmare. Simply pointing to the existing ANSI/ACCA Standard should be sufficient and still satisfy the need in the marketplace for our Raters. Appendix A of that ANSI/ACCA is part of the standard and compliance with it is required to conform.

We should direct the Standards Development Committee to supply ACCA with Sections 807 and 808 of Addendum 2 as a proposed amendment to their ANSI Standard protocols for CO Testing and Depressurization Test of the Combustion Appliance Zone. That document, together with the proposal from the CAZ Working Group comprised of ACCA, American Gas Association, and other stakeholders, would provide ACCA with input into their ANSI Standard and strengthen the existing standard.

We should continue to require the CAZ and Work Scope academic exam and the CAZ simulator exam for certification for all Rating Field Inspectors, Raters, Trainers, and Quality Assurance Designees (amendment for latter has been proposed). I believe the Interplay ResCAZ simulator aligns very well with the ANSI/ACCA Standard 12 QH protocols.

Continuing to develop and improve CAZ standards, particularly when there is a competing ANSI Standard from an industry partner, will do more long-term harm than good and contribute to greater confusion in the marketplace.