

Weatherization Best Practices



Gas ranges and cook stoves

September, 2010

Background: The purpose of this guidance is to provide clarification on testing, assessing repairs, and replacement of natural gas or propane ranges, cook stoves and ovens. Historically, Minnesota Weatherization protocols did not address residential gas ranges. However, DOE now requires all states to have procedures in place to assess the safe operation of ranges and ovens. Testing for carbon monoxide (CO) is required on gas range burners and their ovens. Results must be recorded in the WA software by going to the WA audit section, clicking on the "Health and Safety" tab, and then clicking on the "Equipment" sub-tab.

Energy auditors are responsible for educating weatherization clients how gas ranges operate and how the CO produced by gas ranges affects the health and safety of people in a dwelling. Industry standards allow the emission of relatively high levels of CO for these combustion appliances. In addition, no exhaust venting is required. The weatherization program requires servicing appliances when CO test standards are exceeded.

Service or repair costs may be charged to the Health and Safety line item of DOE or ARRA funding. DOE does not permit use of its funds to cover replacement costs. Ranges may not be replaced as standalones. Documentation of the repairs must be indicated in the household file and in the WA notes and comments. Utility Conservation Improvement Program (CIP), or other agency or non-DOE resources, may also be considered for replacement costs.

Best Practice—Testing Gas Ranges: It is a best practice and requirement that all gas ranges be tested to ensure efficient and safe operation. The Minnesota WAP Combustion Appliance Performance Indicators lists gas ranges as having a Level I or a Level II standard. There is also a standard for the oven operation.

- Always test the top burners first, and then test the oven. Measure each burner for CO.
- After testing the range top burners, turn the oven on and set it to bake at 450 to 500 degrees.
- Remove any aluminum foil from the oven because it significantly alters convection flow and creates higher CO levels.
- After ten minutes at a high temperature, measure the CO level in the exhaust gases at the oven vent opening before the dilution air and in the room ambient air.
- Document the results in WA under the Health and Safety Tab/Cook Stove.

The Level I test standard for ovens is 100 to 300 ppm of CO after ten minutes of operation. If test measures are between 100 and 300 ppm, arrange for the installation of a carbon monoxide detector in the kitchen and for repair services on the appliance. Discuss this with the client and document in the WA file and on the client's Health and Safety form.

The Level II test standard for ovens is 300 or more ppm of CO after ten minutes of operation. For Level II, the required action is to service the appliance prior to weatherization work. If test results indicate a measurement

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greater than 300 ppm of CO after servicing, exhaust air ventilation must be provided for the appliance. Ventilation should have a minimum capacity of 25 CFM continuous or 100 CFM intermittent fan operation.

The standard for top burners is 50 ppm of CO or less. The test probe should be held eight inches above the flame and held in place until the reading is stabilized. Do not put the probe into or close to the flame. Test each range top burner separately. The appliance should be serviced if the CO level for any burner is higher than the 50 ppm standard. Unusually high levels of CO may require shutting off the gas to the appliance. Discuss this with the client and document the conversation on the Health and Safety form. Gas leaks should be immediately addressed. Note that the American National Standards Institute (ANSI) standard for CO 'free air' test measurement for gas ranges is 800 ppm or less. (This is actually an emissions rate. See www.karg.com for additional information.)

The following information should be explained to the client:

- Never wrap aluminum foil around a range burner or place it in the bottom of the oven. It creates high CO and creates an unsafe condition.
- Never use a range burner or gas oven as a space heater. It creates high CO, high moisture levels and an unsafe condition.
- Open a window and turn on the kitchen exhaust fan when using the range or oven, especially if the home is tight.
- Keep range burners and ovens clean in order to prevent dirt from interfering with combustion.
- Burner flames should be a 'hard blue' color. Call for repair if the flames are yellow or white.
- Some ranges are equipped with adjustable needle-and-seat valves. Know where the gas valve is located to shut off the appliance.

Date:

September, 2010

Policy References:

Combustion Appliance Performance Indicators

Required Weatherization Tests

Health and Safety

Minnesota Weatherization Field Guide

Minnesota Mechanical Systems Field Guide

http://www.karg.com/pdf/Presentations/Gas_Range_Protocol.pdf



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