



Special Announcement

“Outside” Masonry Chimney Restrictions for Residential Gas Customers

Authority

WSSC is the jurisdictional authority for natural gas and propane appliance installations in Prince George’s and Montgomery Counties with the exception of the Cities of Rockville and Poolesville. Note: the King Farm section of Rockville is under WSSC regulatory jurisdiction. This regulatory authority is also not limited to Customers only served by WSSC’s water or sewer service, but governs residents served by private wells and/or septic systems and City of Bowie customers as well.

Scope

WSSC is providing notice of very important installation restrictions for residential gas customers whose gas appliances vent into an exterior “outside” masonry chimney. An “outside” chimney is defined as having one or more of the chimney surfaces exposed to the outdoors below the roof line. Following this important chimney information, WSSC is also providing information, for *all* residential occupants, regarding specific gas appliance installation issues: Carbon Monoxide detectors; combustion air requirements; expansion tanks; vent connector sizing; gas and water shut-off valves; flexible gas connectors; and license, permit and inspection requirements.

Background

The venting restrictions are a sign of the changing times and were brought about by changes in federally mandated operating efficiencies for gas appliances, which in turn, drove improvements to the International Fuel Gas Code (IFGC). The IFGC is the adopted technical guidelines that WSSC uses in concert with the WSSC Plumbing and Fuel Gas Code. The IFGC has published a number of new and revised code sections and related sizing charts to account for changes to gas equipment efficiencies. These improved efficiencies have a direct impact on the venting/exhaust characteristics of gas appliances. Primarily, these restrictions will affect the installation and/or replacement of residential type gas furnaces, boilers, and water heaters.

Appliance Terms:

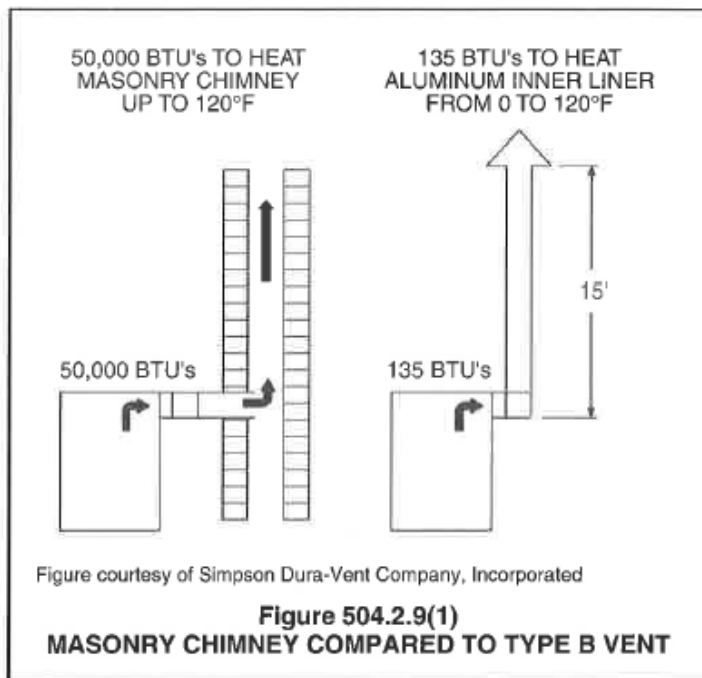
- 1.) **Low-efficient Space Heating Appliance.** A warm air furnace or boiler with an energy efficiency rating below 80%. These dinosaurs were factory equipped with a draft hood and due to energy codes they have been marketplace-obsolete since the early 90’s. National energy standards do not allow them to be sold any longer.
- 2.) **Mid-efficient Space Heating Appliance.** A warm air furnace or boiler with an energy efficiency rating between 80-89%. Very common for this area; typically uses a vertical main vent (either masonry or round metal “B-vent”).
- 3.) **High-efficient Space Heating Appliance.** A warm air furnace or boiler with an energy efficiency rating of 90% or greater. Uses a plastic vent system (1 or 2 pipes) and is not interconnected with other appliances or connected into a chimney; it vents independently and directly outdoors.
- 4.) **Draft Hooded Water Heater (low efficiency).** The most common variety of gas water heater.
- 5.) **High-efficient Water Heater.** Like its space heating counter parts, uses a plastic vent system (1 or 2 pipes) and is not interconnected with other appliances or connected into a chimney; it vents independently and directly outdoors.

Technical Justifications

As gas appliance energy efficiency has increased, the appliance’s corresponding vent/flue/exhaust temperatures have been lowered. With lower vent/flue/exhaust temperature there is an increased probability of the vent/flue/exhaust gases/vapors (the by-products of combustion) turning to liquid form

before they can vent out (travel up and out), the top of the chimney. Nowhere is this more likely than with an “outside” masonry chimney. Masonry chimneys by their nature require significantly higher temperatures, and for greater duration, in order to “warm” the mass that is the chimney structure. See the illustration below. Add exposure to exterior cold temperature influences and it is a losing battle for the vent/flue/exhaust gases/vapors. As the gases/vapors liquefy, the resulting condensate water (which is acidic), will cover/coat the inside liner of the chimney. Over time, the condensate can be responsible for the degradation of the interior lining of the chimney and in some cases, negatively impact the gas appliance(s) and the vent connector piping which connects each appliance to the chimney. In the long run, the chimney passageway can become blocked, the connector piping and chimney can deteriorate to the point of collapse, or the appliance itself can deteriorate. With any of these failing scenarios, vent/flue/exhaust gases are going to be expelled into the living quarters which significantly increase the chance of dangerous Carbon Monoxide (CO) gas being produced; which will also be expelled into the living quarters. It is that serious.

Another issue related to cold chimneys is the potential for “damming” of the natural flow of the flue gases/vapors. In this case, the entire venting dynamic is slowed which effects the amount of extra air entering the chimney for drying purposes and also lead to imperfect combustion. The latter has an adverse effect on overall efficiency and it can cause production of excessive carbon monoxide (CO) which is a great concern with any slow vent or if vent spillage occurs.



Illustration

Figure 504.2.9(1) has been copied from the 2012 International Fuel Gas Code and Commentary. It explains why masonry chimneys, particularly “outside” chimneys, are so hard to “warm-up” and also how difficult they are to keep warmed.

The Restriction

In most applications where space heating appliance(s) [furnaces and boilers] are served by an “outside” masonry chimney, the chimney will require the installation of a listed liner when *any* of the existing appliances served by the chimney are replaced. According to the sizing charts contained in the 2012 International Fuel Gas Code

(IFGC), **outside chimneys cannot be utilized “as is”** unless a minimum of 300 – 400 Thousand Btu’s are connected. Given that most residential applications of space heating appliances and water heaters are limited to about 175 Thousand Btu’s, outside chimneys are virtually eliminated as an approvable application from this point forward. Please take note of the terms and following scenarios below; there are applications where a water heater can still utilize an outside chimney.

What should a homeowner or occupant expect if they have an exterior “outside” masonry chimney?

Refer to the table on the following page for the specific scenarios and follow the requirements outlined in the last column; in addition, the installing plumber/gasfitter shall also refer to the *International Fuel Gas Code* for details:

"Outside" Masonry Chimney Venting - Required Action regarding Water Heaters and Space Heating Appliances

Scenarios	Water Heater Status and Efficiency	Space Heating Appliance Status and Efficiency	Venting Requirements and Comments
1	Existing (to Remain) Any efficiency	Existing (to Remain) Any efficiency	There is no requirement to upgrade a chimney/vent unless one or more appliances are replaced or removed from the current venting configuration. However, heed the installation/operation instructions for your current appliance(s): have the chimney, the appliance(s), and the vent connector piping inspected annually; and clean, repair or abate as needed.
2	New or Replacement Draft Hooded - Low Efficiency	Existing (to Remain) High Efficiency	Water heater can vent into "outside" chimney providing the interior cross sectional area of the chimney flue is not greater than 7 times the area of the draft hood outlet and the chimney is inspected for integrity.
3	New or Replacement High Efficiency (replacing draft hooded WH)	Existing (to Remain) High Efficiency	Install new water heater vent directly to outdoors per manufacturer's instructions, coordinate with space heating appliance venting instructions, and cap old chimney inlet(s).
4	New or Replacement Draft Hooded - Low Efficiency	Existing (to Remain) Mid or Low Efficiency	Water heater and furnace/boiler can no longer vent into "outside" chimney. Chimney must be relined with a listed liner (meeting UL 1777) or with a "B-Vent" or both appliances can be replaced with High-efficient appliances and the chimney inlet(s) capped.
5	New or Replacement High Efficiency (replacing draft hooded WH)	Existing (to Remain) Mid or Low Efficiency	Install new water heater vent directly to outdoors per manufacturer's instructions. However, the existing Space Heating Appliance can no longer vent into the old chimney. The chimney will have to be relined as described in number (4) above or the Space Heating Appliance will have to be replaced with a High-efficient model.
6	Existing (to Remain) Draft Hooded - Low Efficiency	New or Replacement Mid or Low Efficiency	The chimney will require relining per number (4) above or the new Space Heating Appliance could be vented independently per its "Category 3" venting instructions, if applicable. In this case the Draft Hooded Water Heater can remain venting into the chimney providing the parameters of number (2) above can be met; otherwise a smaller listed liner or "B-vent" shall be installed for the water heater alone.
7	Existing (to Remain) Draft Hooded - Low Efficiency	New or Replacement High Efficiency	The chimney can continue to serve the water heater providing the parameters of number (2) above can be met or the chimney shall be relined with a smaller listed liner or "B-vent" per number (4) above.
8	New, Replacement or Existing Electric Water Heater	New, Replacement or Existing All Electric Heat Pump	The installation of an electric water heater and/or an all electric heat pump shall be treated the same as the installation of a High-efficient Water Heater or a High-efficient Space Heating Appliance, see the related scenarios above for required actions.

Important Safety Messages:

License, Permit and Inspection Required – All of the above mentioned work, and in fact, *any* new or replacement gas appliance is required to be installed by a licensed plumber/gasfitter. Unqualified, unlicensed individuals/companies as well as homeowner's are strictly *prohibited* from engaging in *any gasfitting work*. Be sure to solicit multiple prices, insist on proof of licensed technicians, and be sure the contractor is getting his/her work inspected (and approved) by a WSSC Plumbing Inspector. This is for your safety and the safety of your family and visitors.

Chimney Inspections and Maintenance - Be sure to have *all* chimneys and vents inspected and cleaned annually. Remove all accumulations from the base of chimneys and vents (dirt pockets), each and every time, and prior to placing any equipment into service. This applies to all inside and outside chimneys, as well as metal vent systems. Always check the integrity of the whole venting system; don't be out-of-sight, out-of-mind!

Carbon Monoxide Detectors (CO) – Detectors with alarms are required when a gas appliance is installed or replaced (including generators & pool heaters). They are recommended for any home or dwelling unit which has any of the following: existing gas appliances, solid fuel burning (wood, pellets or coal), or an attached garage. They are required in all new construction for any type of building which contains sleeping quarters. CO Detectors shall meet UL 2034 and may be hard-wired, plug-in or battery-only.

Combustion Air – (Make-up air) shall be provided for confined appliances. Two make-up air openings into the appliance room shall be located as follows: one opening within 12" of the ceiling and one opening within 12" of the floor. Each shall be sized as follows: one square inch per each 1,000 Btu's of gas input. [e.g. 140,000 total Btu's = (2)-140 square inch openings (net); one at top and one at bottom]. Note: louvers and grills reduce effective openings, upsize openings, louvers and grills accordingly. The minimum opening size is 100 square inches (net).

Expansion tanks – For new and replacement water heaters, expansion tanks are only required if the water piping within the home is a "closed" system. Plumbers need to determine if the home has one of the following three items which create a "closed" system: whole house backflow preventer; a check valve within the cold supply ahead of the water heater; or a pressure-reducing valve (a bell shape device near the main water shut-off valve). Where none of these devices are present, it is still a good idea to have an expansion tank installed, they will help abate water hammer and most water heater manufacturers recommend the installation of one.

Vent connector sizing – The requirement to upsize various appliance vent connectors falls within the many sizing charts contained in the International Fuel Gas Code. There is no set rule or code regulation. Plumbing and Gasfitting contractors should be able to demonstrate the requirement based on the variables of venting material, common vent height, connector materials, connector heights and lengths, appliance input rating, among others.

Gas and water shut-off valves – Gas appliance shut-off valves shall be listed and approved for their use. Existing valves shall meet this requirement or be replaced. New water shut-off valves shall be "full port, lever handle" type. Existing water valves can remain in service providing they are sound and functional.

Flexible gas connectors – Flexible gas connectors are approved for final connection of gas appliances. Connectors shall be listed and approved for their use. They shall be installed in a manner that does not put them at risk of physical damage. Piping connected to a flexible connector shall be supported and protected from potential damage. Flex connectors are not listed for repeated use; when an appliance is replaced, a new flex connector shall be provided.