STANDARDS UPDATE NOTICE (SUN)
ISSUED: June 19, 2018

STANDARD INFORMATION

Standard Number: ANSI Z21.88 / CSA 2.33
Standard Name: Vented Gas Fireplace Heaters
Standard Edition and Issue Date: 8th Edition Dated December 1, 2017
Date of Revision: December 1, 2017
Date of Previous Revision of Standard: 7th Edition Dated November 1, 2016

EFFECTIVE DATE OF NEW/REVISED REQUIREMENTS

Effective Date: **September 1, 2019**

IMPACT, OVERVIEW, AND ACTION REQUIRED

Impact Statement: A review of all Listing Reports is necessary to determine which products comply with new/revised requirements and which products will require re-evaluation. **NOTE:** Effective immediately, this revised standard will be exclusively used for evaluation of new products unless the Applicant requests in writing that current requirements be used along with their understanding that their listings will be withdrawn on Effective Date noted above, unless the product is found to comply with new/revised requirements.

Overview of Changes:

- Revised requirements for instructions
- Additional requirements for category determination test
- New requirements for appliances that are category II or IV
- New requirements for Vented condensing gas fireplace heaters
- New annex for Corrosion resistance criteria and test method for condensing appliances

Specific details of new/revised requirements are found in table below.

If the applicable requirements noted in the table are not described in your report(s), these requirements will need to be confirmed as met and added to your report(s) such as markings, instructions, test results, etc. (as required).

Client Action Required:

Information – To assist our Engineer with review of your Listing Reports, please submit technical information in response to the new/revised paragraphs noted in the attached or explain why these new/revised requirements do not apply to your product (s).

Current Listings Not Active? – Please immediately identify any current Listing Reports or products that are no longer active and should be removed from our records. We will do this at no charge as long as Intertek is notified in writing prior to the review of your reports.

STANDARD INFORMATION

CLAUSE	VERDICT	COMMENT
		Additions to existing requirements are underlined and deletions are shown lined out below.
1	Info	**Scope**
1.2		***New clause added;*** Clauses 4 and 5 cover all vented gas fireplace heaters. In addition, Clauses 6 and 7 address the requirements specific to vented condensing gas fireplace heaters.
4	Info	**Construction**
4.5	Info	**Glass fronts**
4.5.5		***New clause added;*** When an appliance does not require a safety barrier (see Clause 4.1.7), the outside glass viewing area surface shall be tempered glass.
4.33	Info	**Instructions**
4.33.1		Each appliance shall be accompanied by clear, concise printed instructions and diagrams adequate for proper field assembly, installation, maintenance, safe use, and operation. <u>Instructions shall bear the symbol of the organization conducting tests for compliance with this Standard.</u> The front cover or, in the absence of a cover, the first page shall bear the following statements. They shall be boxed as shown:
4.33.2		These instructions shall include: a) assembly instructions for field installed parts and components, including all controls and accessories (when applicable). b) installation instructions specifying: i) that the installation must conform with, as applicable: 1) The installation must conform with local codes or, in the absence of local codes, the National Fuel Gas Code, ANSI Z223.1/NFPA 54, or the Natural Gas and Propane Installation Code, CSA B149.1. 2) For appliances for recreational vehicle installation, the Standard for Recreational Vehicles, ANSI A119.2, or the Standard for Gas Equipped Recreational Vehicles and Mobile Housing, CSA Z240.4. 3) A manufactured home (USA only) or mobile home OEM installation must conform with the Manufactured Home Construction and Safety Standard, Title 24 CFR, Part 3280, or, when such a standard is not applicable, the Standard for

Manufactured Home 70Installations, ANSI A225.1/NFPA 501A, or Standard for Gas Equipped Recreational Vehicles and Mobile Housing, CSA Z240.4.

4) For Category II or IV heaters:

A) When the manufacturer supplies the venting system, the instructions shall include a parts list and instructions covering the installation of properly identified parts to provide for the venting of the vent gases to the outdoors. (See Clause 6.2.)

B) When the parts for venting the vent gases are not provided by the manufacturer and they are specific types listed by a nationally recognized testing agency, the instructions shall clearly identify and specify the use of the specific parts, and the standard under which the vent system components are listed. The instructions shall indicate that only pipe listed under the specific standard shall be used to vent the heater. [See Clause 4.34.2 w).]

C) A non-metallic venting system shall comply with the Standard for Venting Systems for Gas-Burning Appliances, UL 1738, and in Canada shall comply with the Standard for Type BH Gas Venting Systems, ULC S636.

xxiii) a maintenance schedule, when a means is provided to neutralize condensate, if required.

xxiv) periodic cleaning of the condensate collection and disposal system(s), if required.

xxv) "Non-metallic venting systems shall not interchange components with another listed or unlisted metallic vent system."

j) For Category II and IV appliances, the venting system shall be installed in accordance with the appliance manufacturer's instructions.

k) Instructions for proper venting installation:

i) Horizontal portions of the venting system shall:

1) Be supported to prevent sagging. The methods and intervals for support(s) shall be specified in the installation manual(s).

2) Slope upwards not less than 1/4 in/ft (21 mm/m) from the appliance to the vent terminal.

3) Category II and IV appliances shall be installed so as to prevent accumulation of condensate in the venting system.

ii) Category II and IV appliance installations shall provide a means for removal of condensate.

iii) Heater installation instructions, which accompanying a heater or other appliance that can utilize a side wall vent system, shall include information on where the vent terminal can and cannot terminate, including (see Figure 2, Vent terminal clearances):

For Category II and IV appliances, the following statement: "The vent for this heater shall not terminate:

1) Over public walkways; or

2) Near soffit vents or crawl space vents or other areas where condensate or vapor could create a nuisance or hazard or cause property damage; or

3) Where condensate vapor could cause damage or could be detrimental to the operation of regulators, relief valves, or other equipment."

l) When an existing Category I heater is removed or replaced, the original venting system may no longer be sized to properly vent the attached appliances. Instructions shall also indicate effects of an improperly sized venting system (formation of condensate, leakage, spillage, etc.) and shall specify the following test procedure.

⚠ WARNING
CARBON MONOXIDE POISONING HAZARD
Failure to follow the steps outlined below for each appliance connected to the venting system being placed into operation could result in carbon monoxide poisoning or death. The following steps shall be followed for each appliance connected to the venting system being placed into operation, while all other appliances connected to the venting system are not in operation:

1) Seal any unused openings in the venting system.
2) Inspect the venting system for proper size and horizontal pitch, as required in the *National Fuel Gas Code*, ANSI Z223.1/NFPA 54 or *the Natural Gas and Propane Installation Code*, CSA B149.1 and these instructions. Determine that there is no blockage or restriction, leakage, corrosion and other deficiencies which could cause an unsafe condition.
3) As far as practical, close all building doors and windows and all doors between the space in which the appliance(s) connected to the venting system are located and other spaces of the building.
4) Close fireplace dampers.
5) Turn on clothes dryers and any appliance not connected to the venting system. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they are operating at maximum speed. Do not operate a summer exhaust fan.
6) Follow the lighting instructions. Place the appliance being inspected into operation. Adjust the thermostat so appliance is operating continuously.
7) Test for spillage from draft hood equipped appliances at the draft hood relief opening after 5 minutes of main burner operation. Use the flame of a match or candle.
8) If improper venting is observed during any of the above tests, the venting system must be corrected in accordance with *National Fuel Gas Code*, ANSI Z223.1/NFPA and/or *Natural Gas and Propane Installation Code*, CSA B149.1.
9) After it has been determined that each appliance connected to the venting system properly vents when tested as outlined above, return doors, windows, exhaust fans, fireplace dampers and any other gas-fired burning appliance to their previous conditions of use.

4.34	Info	**Markings**
4.34.2		**Rating plate(s)** Each appliance shall bear a plate, or a combination of plates in proximity, of Class IIIA marking material located so as to be easily read when the appliance is in a normally installed position. A rating plate(s) applied to the inner surface of a control compartment door is considered acceptable. The following information shall appear on the plate(s): v) For other than a vented condensing space heating appliance (see Clause 3) for outdoor installation incorporating an integral venting system, the Category shall be indicated: i) "Category II"; or

		ii) “Category IV.” w) A condensing appliance with provision for duct connections shall bear a Class III marking to the effect that: “This appliance is for operation at a temperature rise from _____ to _____°F (_____ to _____°C).” x) A condensing appliance shall also be marked for use with ducts, if applicable. y) A condensing appliance with provision for duct connections shall also be marked with the maximum external static pressure.
4.34.8		Each appliance shall bear: m) A Class III marking for a Category II or IV appliance that states: “This appliance requires a special venting system. Refer to the installation instructions for parts list and method of installation.” On parts supplied by the appliance manufacturer for venting vent gases from the appliance to the outdoors, the parts shall be identified.
5	Info	**Performance**
5.4		An appliance venting category shall be determined using the following Method of Test. An appliance found to be a Category II or IV appliance (see Clause 3, Definitions) shall comply with the provisions of Clauses 6 and 7. If the appliance is equipped with a draft hood or draft diverter, but not equipped with a mechanical draft system downstream of the draft hood or diverter, the following categorization pressure test provisions do not apply. These appliances should be assumed to have non-positive vent pressure for the purpose of Categorization (i.e., Categories I and II). These appliances having flue loss less than 17 percent should be assigned to Category II (non-positive vent pressure). (See Clause 3, Definitions.) The following categorization pressure test provisions do not apply to appliances equipped with co-axial type power vent systems. Power vented appliances with co-axial type direct vent systems shall be assigned to Categories IV for venting components located downstream of the power vent and Category II for venting components located upstream of the power vent. Non-power vented appliances should be assigned to Category II (non-positive vent pressure). The following categorization temperature test provisions do not apply to appliances equipped with co- axial type direct vent systems. Appliances with co-axial direct vent systems that do not attain the minimum temperature requirements of Clause 5.35 when tested with the maximum vent length, shall be assigned Category II or IV. **Method of Test** This test shall be conducted using natural gas only, unless the appliance is for use with propane gas only, or if the manufacturer specifies different inputs for natural and propane gas.

The appliance shall be connected to a vent pipe the same size as the draft hood outlet or flue collar (on appliances not equipped with a draft hood). Elbows shall be 90 degrees (1.57 rad).

When the flue gases are vented horizontally, a 2 ft (610 mm) section of vent pipe extending horizontally, an elbow, and a sufficient length of vertical vent pipe shall be attached to provide a total height of 5 ft (1.52 m) measured from the highest point of the draft relief opening(s) or flue collar to the top of the vertical vent pipe. When the flue gases are vented vertically, an elbow, a 2 ft (610 mm) section of vent pipe extending horizontally, a second elbow, and sufficient vertical vent pipe shall be attached to the draft hood outlet or flue collar to provide a total height of 5 ft (1.52 m) measured from the highest point of the draft relief opening(s), or flue collar, to the top of the vertical vent pipe.

The horizontal run of vent pipe shall be pitched upward 1/4 inch to the foot (21 mm to the meter).

A piezo ring (see Figure 4, Piezo ring and details of typical construction) shall be installed at the midpoint of the 2 ft (610 mm) section of vent pipe extending horizontally. A differential pressure gauge, which can be read directly to 0.005 in wc (1.24 Pa) pressure, shall be attached to the piezo ring to measure static pressure.

Flue gas temperatures shall be measured in the vent pipe, 12 in (305 mm) from the top of the vent pipe. Two lines intersecting at 90 degrees (1.57 rad) shall be established in the plane of measurement. They shall be oriented so they divide the flue collar internal outlet area into quadrants.

One temperature shall be taken at the intersection of the two lines. Eight temperatures shall be taken in two sets of four along each line at points 1/3 and 2/3 of the distance from the intersection to the locations. The flue gas temperature shall be the average of these nine individual readings.

When the method of temperature measurement above is not practical, the procedure shall be at the discretion of the testing agency. In such an event, the procedure shall be recorded and reported.

The vent pipe shall be insulated* and all pipe seams and joints shall be sealed.
* Insulation shall be by means of foil-faced R-7 material or greater.

For an appliance having a single input rating
The appliance shall be operated at normal inlet test pressure. When equilibrium conditions are attained, the temperatures indicated by the thermocouples shall be recorded. A sample of the vent gases shall be secured at the outlet of the test vent and analyzed for carbon dioxide as specified in Clause 5.5.2, Combustion. The net vent gas temperature shall be determined by subtracting the room temperature

from the vent gas temperature. (See Figure 5, Chart for determination of appliance Category.)

The static pressure of the vent shall be measured by use of the piezo ring and recorded. If this pressure is positive, the appliance shall be subjected to the tests specified in Clause 7.2.

The category of the appliance with respect to the venting system shall be determined using Table 6, Determination of Category, and Figure 5, Chart for determination of appliance Category.

For an appliance having multiple input rates
This test shall be conducted as specified for an appliance having a single input rating, above, except as follows:

The test to determine the static pressure in the vent shall be conducted at the maximum input rating only.

The net vent gas temperature and carbon dioxide concentration shall be determined at both minimum and maximum input ratings. The tests at maximum input rating need only be conducted on appliances that vary circulating airflow in conjunction with the input rate.

Using the data obtained above, the category of the appliance with respect to the venting system shall be determined using Table 6, Determination of Category, and Figure 5, Chart for determination of appliance Category.

If two categories are determined during conduct of this test, the appliance shall be rated at the higher of the two category numbers, and the venting system specified shall be suitable for both the highest and lowest flue gas temperatures determined above.

New figure added;

Piezo ring and details of typical construction

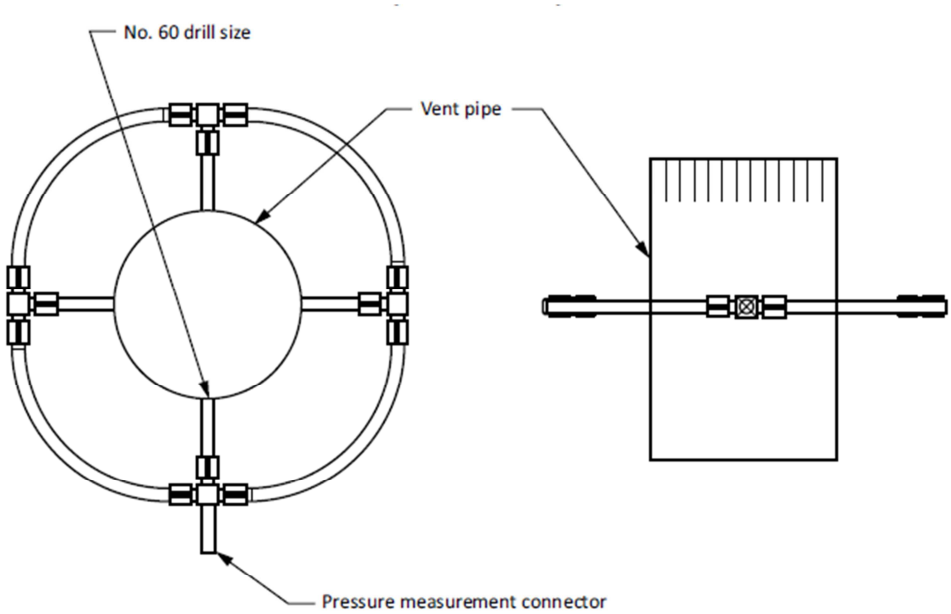

Figure 4

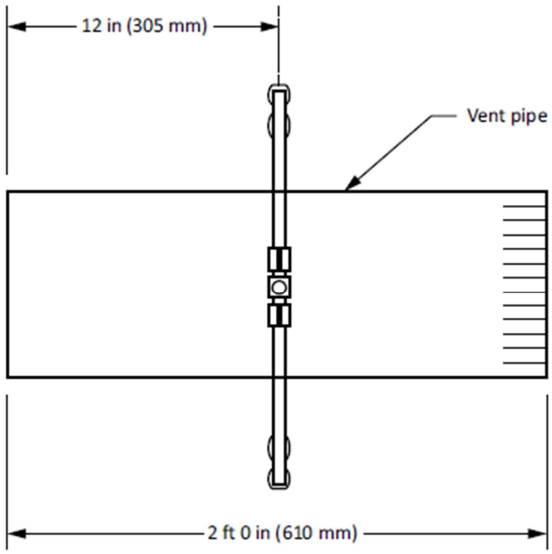

Figure 5

New figure added;

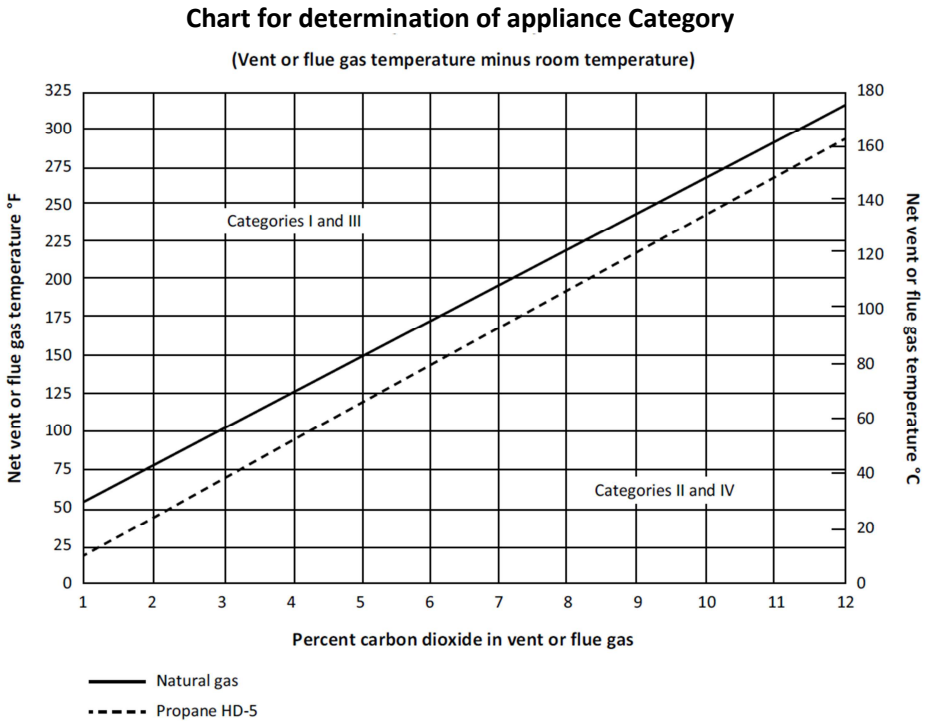

Table 6

New table added;

Determination of Category

	Vent	**Net flue gas temperature °F (°C) (see Figure 5)***
Category I	Non-positive	On or above curve
Category II	Non-positive	Below curve
Category III	Positive	On or above curve
Category IV	Positive	Below curve

** This is equivalent to a requirement for Category I and III appliances, the flue loss of the heater shall not be less than 17 percent.*

6

New section added

Vented condensing gas fireplace heaters (construction)

6.1 **Scope**

6.1.1 All applicable construction requirements outlined in Clause 4 also apply to a vented condensing gas fireplace heater, unless otherwise specified herein.

6.1.2	Clause 6 only applies to Category II and IV appliances. If test results show that the appliance is other than a Category II or IV appliance, the appliance will not fall under the confines of Clauses 6 and 7.
6.1.3	A vented condensing gas fireplace heater is not for use with a draft hood.
6.2	6.2 General construction and assembly A Category II or IV heater shall be provided with the means for venting* the vent gases to the outdoors unless the necessary parts to accomplish this are of specified types listed by a nationally recognized testing agency and the heater manufacturer's instructions and marking identify and specify the use of such specific parts [see Clause 4.33.1l) and Clause 4.34.2w)]. The instructions shall further specify the standard under which the vent system components are listed. ** Means for venting may be accomplished by a method controlled by the manufacturer that shall result in both the heater and the venting means being available at the time of installation.*
6.3	**Vent-air intake pipes**
6.3.1	The venting system for use with a Category II or IV appliance shall be constructed of material resistant to corrosion by condensate as determined by Annex J, Corrosion resistance criteria and test method (see Clause 4.1.11). Non-metallic venting material shall be judged on its temperature limitations, strength, and resistance to the action of condensate, and comply with the Standard for Venting Systems for Gas-Burning Appliances, UL 1738, in accordance with Annex L, and in Canada comply with the Standard for Type BH Gas Venting Systems, ULC S636.
6.3.2	A venting system supplied with a Category IV appliance shall be gas-tight. (See Clause 4.3, Venting for Category II or IV Appliances.)
6.3.3	A venting system supplied with a Category II or IV appliance shall be water-tight. (See Clause 4.3, Venting for Category II or IV Appliances.)
6.4	**Condensate disposal**
6.4.1	Components within the appliance related to the collection and disposal of condensate shall not be adversely affected by the acidity of the condensate as determined by Annex J, Corrosion resistance criteria and test method.
6.4.2	On a Category II or IV appliance, means shall be provided for the collection and disposal of condensate, as determined under Clause 5.4, Category determination.
6.4.3	A venting system for use with a Category II or IV appliance shall have means provided for the collection and disposal of condensate.
6.4.4	A condensate trap(s), if necessary for compliance with Clause 7.4, Condensate disposal systems, shall be provided as part of the appliance or supplied with the appliance along with instructions for proper installation.
6.4.5	The condensate drain line(s) supplied shall not be adversely affected by the composition of the condensate as determined by Annex J, Corrosion resistance criteria and test method for condensing appliances.

6.4.6	Where a condensate neutralizer is provided, an overflow shall be provided such that condensate shall be directed to the drain in the event the neutralizer becomes plugged.
6.5	**Condensate pumps**
6.5.1	A condensate pump shall comply with the applicable provisions of the Standard for Liquid Pumps, CSA C22.2 No. 108, and the Standard for Motor Operated Water Pumps, UL 778.
6.5.2	A condensate pump shall be mounted in a non-combustible enclosure.
7	***New section added;*** **Vented condensing gas fireplace heaters (performance)**
7.1	**General** A Category II or IV appliance shall comply with all of the applicable performance provisions specified in this Standard, with the minimum vent length specified by the manufacturer. In addition, the tests specified in Clauses 5.5, Combustion, 5.7, Burner operating characteristics, 5.10, Pilot burners and safety shutoff devices, and 5.11, Direct ignition systems, shall be conducted with the appliance equipped with the maximum vent length specified by the manufacturer. Other vent configurations deemed critical may be tested at the discretion of the testing agency. The vent terminal or cap supplied or specified by the manufacturer shall be in place during all performance tests, unless otherwise specified.
7.2	**Venting systems for Category II or IV appliances** A venting system, supplied with or specified for use with a Category IV appliance, shall be gas-tight. A venting system, supplied with or specified for use with a Category II or IV appliance, shall be water-tight. This provision shall be deemed met if leakage from the venting system is not in excess of the limit specified in the following Method of Test. **Method of Test** This test shall be conducted using the maximum air inlet and vent lengths and number of joints, including fittings, as specified by the manufacturer [see Clause 4.33.1b)xxv)]. For purposes of this test, the manufacturer shall supply: (1) the venting system that incorporates the maximum specified number of fittings; and (2) a sealed test fitting incorporating the vent collar to which the venting system is to be attached. This test fitting shall also have an inlet tap(s) to which a pressure source and a pressure measuring device can be attached. The vent and air inlet terminals shall be removed, and the entrance of the air inlet section sealed at the point it enters the combustion chamber. The entire system, including the combustion air and flue gas connections between the appliance and the vent and air inlet terminals, shall be installed and sealed in accordance with the manufacturer's instructions.

Both the flue outlet and the air inlet shall then be sealed at the point of connection to the vent and air intake terminals.

The inlet fitting shall be connected to an air supply (pressure source) and a pressure measuring device for measuring the internal pressure of the system. This device shall be capable of being read to 0.01 in wc (2.5 Pa).

A suitable supply of clean air shall be permitted to flow through a metering device and into the section of the direct vent system being pressurized through the air supply fitting. The air supply fitting to the section of the system not being pressurized shall be open.

Above the normal operating system pressure for forced draft systems operating at positive combustion chamber pressures; and (2) 0.1 in wc (25 Pa) for all other systems. The leakage rate shall be noted in cubic feet per hour (cubic centimeters per second) for both the air inlet and combustion chamber sections of the direct vent system.

This provision shall be deemed met if leakage from the combustion chamber-vent section of the system does not exceed 4.0 percent of the products of combustion and leakage from the air intake section of the system does not exceed 8.0 percent of the products of combustion. These values shall be determined by the following appropriate formulae:

$Lc = 0.04 \times V \times I$
$La = 0.08 \times V \times I$

where
Lc = allowable leakage rate from combustion chamber-vent of direct vent system, cubic foot per hour (cubic centimeters per second)
La = allowable leakage rate from air intake section of direct vent system, cubic foot per hour (cubic centimeters per second)
V = 15 ft3 (0.42 m3) of flue products based on the formation of approximately 10 ft3 (0.28 m3) of dry flue products, plus 5 ft3 (0.14 m3) of excess air, when 1000 Btu (293 W•hr) of fuel gas is burned
I = input rating, in thousands of Btu/hr (thousands of 293 W)

Note: Allowable leakage rates in cubic centimeters per second (cm3/s) for heaters rated in watts (W) can be determined by multiplying the input rating in thousands of Btu/hr by 8.496 for combustion chamber-vent section and by 33.98 for air intake section. Example: Lc = 100,000 Btu/hr × 8.496 = 849,600 cm3/s = 0.8496 m3/hr.

	Corrosion resistance
7.3	The heater and venting systems provided or specified shall exhibit acceptable resistance to corrosion when tested and evaluated according to procedures included in Annex J, Corrosion resistance criteria and test method. See Clauses 4.1.10, 4.32, and 5.35.
7.4	**Condensate disposal systems**
7.4.1	The design of a Category II or IV appliance shall be such that the condensate trap(s) self-primes, and flue products shall not be discharged from the condensate drain line(s) after the condensate trap(s) self-primes under the following Method of Test. Method of Test The test shall be performed with the shortest vent specified by the appliance manufacturer. The vent material shall be a material specified by the appliance manufacturer, and the material with the least heat conduction from the vent gas to the air. The condensate trap(s), if provided or supplied as part of the appliance, shall be installed in accordance with the manufacturer's installation instructions. Do not fill the trap(s) with water prior to conduct of this test. This test shall be conducted simultaneously with those tests specified under Clause 5.30, Draft hoods, or Clause 5.31, Draft tests for appliances not equipped with draft hoods, as applicable, up to and including maximum blocked flue conditions where the appliance continues to operate, except that the appliance, 184all parts of the vent (and vent drain, if applicable), and the ambient temperature shall be 70°F (21 °C) or higher at the start of the test. The ambient temperature shall be maintained at 70°F (21 °C) or higher throughout the test. This provision shall be deemed met if the flue products do not issue from the condensate drain lines more than five hours from the time the test is started.
7.4.2	An appliance having a condensate disposal system(s) shall, under conditions of a blocked condensate drain line(s), continue to operate satisfactorily or shall shut off main burner gas during conduct of the following Method of Test. **Method of Test** The condensate disposal system(s) shall be installed in accordance with the manufacturer's installation instructions. The condensate drain line(s) shall be blocked where the condensate drain line(s) exits the appliance. When the condensate disposal system is provided with an overflow port, blockage shall be applied upstream of the overflow port or the port shall be plugged. The appliance shall be placed into operation at normal input rate(s) and normal inlet test pressure. The condensate disposal system(s) shall be filled to the maximum

	level of water attainable or to the point just prior to causing the appliance to shut off (the method of filling shall be at the discretion of the testing agency). The combustion shall be monitored during filling. At no time shall the combustion level [concentration of carbon monoxide in an air-free sample of the flue (vent) gases when tested in an atmosphere having a normal oxygen supply] exceed 0.04 percent or the appliance shall shut off the main burner gas before the combustion level reaches 0.04 percent. The safety shutoff device shall be bypassed, if necessary, and the appliance cycled as it would under normal operating conditions. The main burner(s) and ignition device(s) shall ignite without delayed ignition, flame roll out, or flashback. The bypass shall be removed. The appliance shall comply with the leakage current and dielectric withstand tests specified in Clauses 9.1.40 and 9.1.41. An appliance that cannot be placed in operation under conditions of blocked condensate drain system shall be deemed to comply with this test.
7.5	**Condensate drain system located in blower compartment** Flue gases shall not issue from any portion of the condensate drain system located in the negative side of the return air blower should a break or separation occur at any point within the drain system when tested in accordance with the following Method of Test. **Method of Test** The appliance inlet shall be blocked in accordance with Clause 5.24, Temperature at discharge air opening, to provide the greatest negative pressure (just prior to limit function) with the negative pressure side of the return air blower. The tests shall be performed at the maximum and minimum vent, whichever creates the most leakage potential. With the appliance set up and operating as above, record the gauge reading. The pressure within the condensate drain system shall be less than the pressure within the negative side of the return air blower. Compliance with this test shall be met, if non-positive pressure (referenced to the negative pressure side of the blower compartment) is present at the outlet of the drain system with the drain system (lines and traps) dry (not primed with water).
Annex J	***New annex added;*** **Corrosion resistance criteria and test method for condensing appliances** This annex contains the test set up and procedure for conducting the corrosion test (see standard for details).

	CUSTOMERS PLEASE NOTE: This Table and column “Verdict” can be used in determining how your current or future production is or will be in compliance with new/revised requirements.