



The following is intended to aide you in discerning venting flue applications and products required for appliances and the possible extent of flue required to safely dispense the exhaust gases.

There may still arise a project where we will need us to assist and that's what we are here for. We are always available to provide engineered design layout, product applications, system sizing, support suggestions and general information.

Quotes

- We will need: plan drawing in scaled PDF or dimensions, appliance cut sheets, distance to roof shown on architectural section or hand drawn with dimensions. If project will connect to existing common flue and/or shaft we will need sizes, construction and extent. For your convenience we have a "[quote request form](#)" for ease of use.

Sizing/Design

- We will need: in addition to the quote requirements above we will need the "[design request form](#)" filled out as much as possible.

Flue Categories

Gas appliances are divided into four venting categories based on vent operating pressure and whether they are condensing or non-condensing. Category I is negative pressure, non-condensing. Category II is negative pressure, condensing. Category III is positive pressure, non-condensing. Category IV is positive pressure, condensing. These categories are used to determine the type of vent that should be used for the appliance.

Appliances that have a combustion efficiency of greater than 83 percent under American National Standard Institute (ANSI) test conditions are rated as condensing and will fall under Category II or IV.

Category I is what we normally think of when we think B-Vent. Negative pressure draws the products of combustion from the appliance breech and lifts them to the atmosphere.

Category II products negative pressure vents with combustion gases at or below the dew point. Heavy gases at the dew point are not buoyant enough to vent with a negative pressure flue.



Category III products are positive pressure and require sealed joints. They can be sidewall vented without additional apparatus. Because these 80 percent appliance flue gases are close to the dew point, and the vent material is single wall, corrosion resistant materials must be used. Drains are typically incorporated to remove flue condensation before it enters the heat exchanger. Category III has been used to solve installation problems where no appropriate flue is available.

Category IV positive pressure condensing appliances, the joints in the flue material again must be sealed. This category applies to 83 percent-plus annual fuel utilization efficiency (AFUE) furnaces. Appliances are designed to dispose of flue condensate as well as condensate formed within the secondary heat exchanger. You may be able to sidewall vent at reduced distances to openings in the building than the National Fire Protection Association (NFPA) suggests. This applies to sealed combustion with combustion air intake in the same pressure plane.

Interesting Notes:

- 100 cubic feet of consumed gas per hour produces approx 1 gallon of water vapor.
- 1M btu equals about 987 cubic ft/hour of natural gas consumption.
- A 3M btu boiler at 95% can produce 28 gallons of water vapor per hour.
- Sub-freezing temps can accumulate frozen combustion water vapors on adjacent surfaces and the acid will damage and/or stain. Always try to avoid sidewall discharge in favor of vertical discharge through the roof with exit cones.
- Sulfur (mercaptan) is added to natural gas so it can be smelled. The sulfur dioxide created from natural gas combustion combines with the water vapors to produce corrosive sulfuric acid. For example, galvanized steel can be corroded in just a few months.
- Poor boiler water quality can drastically reduce efficiency and significantly increase gas consumption and exhaust. 3mm of scale can rise gas consumption by 20%.
- When venting on a roof, the exiting flue gas must be a minimum of 3' above the finished roof and 2' above any object (walls, parapets, etc) within 10' of the exiting flue gas.
- In condensing applications there are some cases a vent cap can accumulate enough condensate to drip back onto the roof and cause corrosion. We recommend an exit cone to discharge and mix into the atmosphere. Any rain entering the flue is a benefit and will be collected in the drain.