

This fact sheet provides an overview of the requirements for the selection of plastic vent materials based on ANSI Z223.1/NFPA 54, National Fuel Gas Code - 2018 (NFGC). The vent requirements in previous code editions, in local jurisdictions, or in specific situations, may differ.

The fact sheet is not intended to replace knowledge of applicable local and national codes or address specific situations. The user should consult a competent professional and be thoroughly familiar with all applicable local codes, and the specific manufacturer's installation instructions.

NFGC REQUIREMENTS¹

The NFGC allows the use of plastic vent materials for specific appliance types. The relevant requirements in the 2018 NFGC are contained in Section 12.5 as follows:

12.5 Type of Venting System to Be Used.

12.5.1 The type of venting system to be used shall be in accordance with Table 12.5.1.

Table 12.5.1 Type of Venting System to Be Used.

Appliances	Type of Venting System	Location of Requirements
Category II, Category III, and Category IV appliances	Specified or furnished by manufacturers of listed appliances	12.5.2, 12.5.4

12.5.2 Plastic Piping. Where plastic piping is used to vent an appliance, the appliance shall be listed for use with such venting materials and the appliance manufacturer's installation instructions shall identify the specific plastic piping material. The plastic pipe venting materials shall be labeled in accordance with the product standards specified by the appliance manufacturer or shall be listed and labeled in accordance with ANSI/UL 1738, *Venting Systems for Gas-Burning Appliances, Categories II, III, and IV*.

12.5.3 Plastic Vent Joints. Plastic pipe and fittings used to vent appliances shall be installed in accordance with the appliance manufacturer's installation instructions. Plastic pipe venting materials listed and labeled in accordance with ANSI/UL 1738, *Venting Systems for Gas-Burning Appliances, Categories II, III, and IV*, shall be installed in accordance with the vent manufacturer's installation instructions. Where primer is required, it shall be of a contrasting color.

12.5.4 Special Gas Vent. Special gas vent shall be listed and labeled in accordance with ANSI/UL 1738, *Venting Systems for Gas-Burning Appliances, Categories II, III, and IV*, and installed in accordance with the special gas vent manufacturer's installation instructions.

USE OF PLASTIC VENTS

Plastic venting systems are commonly used with condensing boilers, furnaces, tankless water heaters, and mechanically vented tanked water heaters. These appliances are listed as Category II, III, and IV appliances. The NFGC allows the use of plastic piping and special vent as the vent where the appliance is listed for use with the plastic piping or special vent and it is installed in accordance with the listed appliance manufacturer installation instructions. Some listed special vents can also be made of plastic materials. The appliance instructions will include the allowed type of plastic pipe material or special vent and will specify the specific standards for that pipe or special vent. The instructions will also contain sizing criteria and provide vent system construction requirements for plastic pipe. Where a plastic special vent is specified by the appliance manufacturer, the vent manufacturers installation instructions must be followed.

The NFGC requires that the selected plastic pipe and fittings be either labeled in accordance with the appropriate ASTM standard, or where the manufacturer specifies a UL 1738 plastic venting system, the venting system must be listed and labeled in accordance with UL 1738. The labeling requirement is designed for inspection purposes to help ensure that the correct plastic pipe material or plastic venting system has been installed.

The plastic pipe or special vent are specified by the appliance manufacturer to ensure that the pipe or vent can perform under the appliance's vent temperature and pressure conditions. To pass the appliance certifying standard the appliance manufacture is required to have the appliance and the pipe or vent tested together. The listed appliance's installation instructions are required to provide a list of the vent materials that have been certified for use with the appliance.

THE USE OF PVC, CPVC, and ABS

Many appliance manufacturers permit the use of PVC (Poly-Vinyl Chloride), CPVC (Chlorinated Poly-Vinyl Chloride) and ABS (Acrylonitrile-Butadiene-Styrene) plastic pipe, depending on the appliance's designed exhaust gas temperature. The appropriate service temperatures for these plastics are: PVC – 150° F; CPVC – 190° F; and ABS – 180° F.

While PVC, CPVC, and ABS are not listed as vent materials, their use in vent systems has been proven to be acceptable and durable. All plastics that are to be specified for use with the appliance being certified are tested with the appliance in accordance with the appropriate ANSI appliance standards.

¹ The 2018 Edition of the International Fuel Gas Code contain extracts of the same venting requirements.

Common pipe standards specified for these plastics include²:

PVC:

- ASTM D2241 – SDR Series
- ASTM D1785 – Schedule 40
- ASTM D2665 – DWV

CPVC:

- ASTM F441 – Schedule 40
- ASTM F442 – SDR Series

ABS:

- ASTM D1527 – Schedule 40
- ASTM D2661 – Schedule 40 DWV

The pipe material standards specify the fittings and the pipe cement to be used. Vent systems are constructed using one of the specified pipe, matching fittings, and the appropriate cement.

UL 1738 PLASTIC VENTS

UL 1738 is a complete venting system standard containing requirements that cover venting systems intended for venting Category II, III, or IV gas-burning appliances. UL 1738 specifically addresses the construction requirements, test performance criteria, marking requirements, and installation and maintenance instructions of the vent system. Vent systems listed to UL 1738 can be plastic or metal, flexible or rigid, and can be single wall or concentric vent systems.

For use in U.S. installations, a UL 1738 vent system may be used only where the appliance manufacturer's installation instructions allow the use of such a vent system. For Canadian installations, a UL 1738 listed vent system must be used. For both countries, the appliance instructions will specify the type of system (plastic, metal, flexible, rigid, etc.)

Polypropylene is a common plastic material used in plastic vent systems listed to UL 1738. The maximum heat service temperature of polypropylene is appropriately 230° F for gas-fired appliances. The listed vent system includes all pipe, fittings, and connecting means. The NFPA requires that where UL 1738 vent systems are installed that they be labeled and installed in accordance with the vent manufacturer's installation instructions.

² The list of standards is not meant to be exhaustive and other plastic pipe standards may be allowed in a manufacturer's installation instructions.