

Getting to Know ANSI Z21.97

Eric Hawkinson
Outdoor Great Room

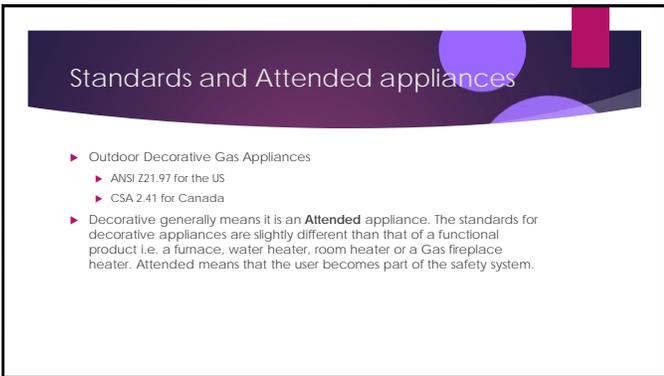
Course Description

Getting to Know ANSI Z21.97 is an educational seminar and in-depth review of the standard. This standard includes outdoor decorative gas appliances classified as built-in, stationary or portable. The seminar will cover technical, codes & standards, liability and safety topics. The following outlines the format:

- Standards and Attended Appliances
- Testing and Definitions
 - o Built-in
 - o Stationary
 - o Portable
- Installation and Guidelines
- Performance and Safety
 - o Ignition
 - o Fuel
 - o Wind
 - o Rain

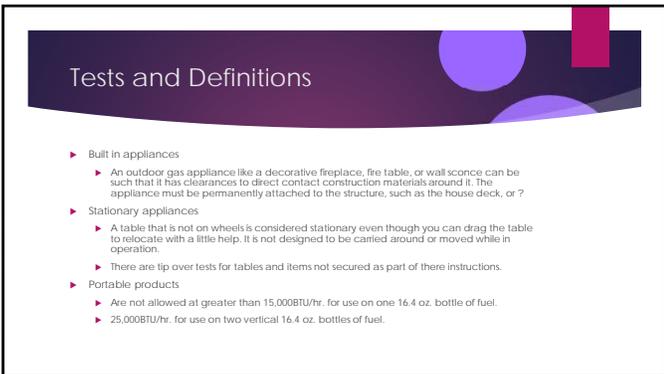


ANSI Z21.97
CSA2.41
INTERESTING ASPECTS OF OUTDOOR DECORATIVE APPLIANCES



Standards and Attended appliances

- ▶ Outdoor Decorative Gas Appliances
 - ▶ ANSI Z21.97 for the US
 - ▶ CSA 2.41 for Canada
- ▶ Decorative generally means it is an **Attended** appliance. The standards for decorative appliances are slightly different than that of a functional product i.e. a furnace, water heater, room heater or a Gas fireplace heater. Attended means that the user becomes part of the safety system.



Tests and Definitions

- ▶ Built in appliances
 - ▶ An outdoor gas appliance like a decorative fireplace, fire table, or wall sconce can be such that it has clearances to direct contact construction materials around it. The appliance must be permanently attached to the structure, such as the house deck, or ?
- ▶ Stationary appliances
 - ▶ A table that is not on wheels is considered stationary even though you can drag the table to relocate with a little help. It is not designed to be carried around or moved while in operation.
 - ▶ There are tip over tests for tables and items not secured as part of these instructions.
- ▶ Portable products
 - ▶ Are not allowed at greater than 15,000BTU/hr. for use on one 16.4 oz. bottle of fuel.
 - ▶ 25,000BTU/hr. for use on two vertical 16.4 oz. bottles of fuel.

Installations and Guidelines

- ▶ **Marking and cautions.**
 - ▶ The installation instructions and marking will supply the needed information related to clearances, input rating, fuel types, and operational details.
- ▶ **More difficult areas of the installation can be things like.**
 - ▶ Is a screen porch outside or inside?, alcoves with three sides, floor, and roof? Are these outside or is it inside. If you put it in a porch area today what happens if someone puts in windows and closes them?
- ▶ **Installed outdoors under a tree?**
 - ▶ What happens as the tree grows and expands? On grass, wood deck, concrete are there concerns?

Clearances and Ventilation

- ▶ **Clearances to Combustibles**
 - ▶ Follow the instructions.
 - ▶ Areas that cannot be seen as part of the enclosure are allowed to rise to 90° + ambient when the appliance has stabilized this is the same as other standards for enclosures made of combustible materials. Areas under a burner or in a table are tested to 90° + ambient to determine how close a enclosure can be.
 - ▶ Exposed materials such as side walls, mantels, and ceilings are allowed 117° rise about ambient.
- ▶ **Ventilation**
 - ▶ If a tank is held in the base of the appliance it is clear that you need ventilation, that is called out in the standard.
 - ▶ What if the tank is not held in the base do you need it then?

Performance and Safety

- ▶ **Ignition**
 - ▶ There are multiple types in use and available, because it is an attended appliance you can go with a simple match lit and no safety shutoff. To a fully automated DSI, IPI, spark to pilot, Hot surface direct ignition, hot surface to pilot.
- ▶ **Fuels**
 - ▶ Natural gas and LP dominate this market. There can be units set up to run on Butane or other bottled fuels. Wood burning fire pits are not covered as a gas product. Factory built fireplaces can be listed under UL127 with specific tests for outdoor fireplaces.

Performance and Safety cont.

▶ Unique tests to outdoors

▶ Wind

- ▶ Wind tests are performed to confirm safe operation under abnormal conditions. These tests are also set up considering the appliance is attended. 3 and 10mph ignitions and flame stability tests are done.
- ▶ 30 mph wind tests, if you are not using a safety shutoff you must test at 30mph and the appliance must stay lit.

▶ Rain

- ▶ The rain test is a 15 minute test that after the tests is over the unit has to operate and perform normally after 13 minutes. There is also a dielectric test performed to ensure that any appliance using 110v or greater does not present an electrical hazard from the moisture.

What it looks like during a rain test



Performance and Safety cont.

Not everything is as it should be

• Snow

- Today there is no snow test performed, this gets back to the attended appliance situation. The consumer is participating in the performance by making sure the appliance is clear of snow, debris, and ice.

• Sub Zero temperatures

- Will the controls, regulator and gas supply work at extreme conditions?
- The regulator and hose if listed is good to -40F, the valves in general are tested to 32F, a manufacture may have tested to colder operating temps.



Allowable levels of CO

- ▶ Air free CO levels
 - ▶ Outdoor 800PPM CO air free is allowed
 - ▶ Indoor Vent free 200PP air free CO allowed
 - ▶ Indoor vented 400PPM air free CO allowed
- ▶ What is air free the calculated measurement of the CO in the flue gas with all the excess air removed.
- ▶ Your direct room reading is not air free combustion number. If you read 200PPM direct on a CO meter you have a major problem with an appliance. If your in a house Get out! ASAP and call the fire department. If your outdoors shut it down and find out what is wrong.

Media varieties

- ▶ Types and looks
 - ▶ Glass
 - ▶ Tempered chips
 - ▶ Glass beads
 - ▶ Lava rock
 - ▶ River rocks
 - ▶ Steel balls
 - ▶ Ceramic balls
 - ▶ Log sets
 - ▶ Others?

Questions ?