



Installation Considerations for Outdoor Gas Appliances

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This session will discuss installation considerations for decorative outdoor gas appliances. Some Dos and Don'ts that installation instructions may not cover that can lead to service calls and other unintended issues. Information about past experiences with site built fire tables and pits and DIY burners including considerations about potential safety concerns not covered in the standards and codes.

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INSTALLATION CONSIDERATIONS FOR Outdoor Gas appliance

Things the standards do not talk about but you may need to think about.*

*These points covered here are not 100% all inclusive of things to look out for, only those thought of at the time of writing. You as the builder, designer, creator or tinker are responsible for what you have done or failed to think of. Please note no ones instructions can think of everything you can do!

Types of outdoor gas decorative appliances:

Built-In Appliances

- An outdoor gas appliance, like an outdoor decorative gas fireplaces, are attached directly to the wall or built into the house.
 - If installed into the side of a house: be careful of vapor barrier, ventilation and insulation issues.
 - Do not site built unlisted appliances for this application - a full masonry must meets local codes. It must properly insulated with a vapor barrier.
 - Ensure there is no home for critters and insects to access the walls or interior of the home.
 - Water must have an exit away from the structure – water entrapment in the home causes rot.
 - Soot from fireplaces that do not draft or do not have a vent will “paint” the side of a house black over time.

Types: Stationary

- A table or pit 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.
 - Tip-over tests for tables, bowls, columns, and more as part of their instructions
 - Hard-piped fuel or internal tank: both are acceptable and require ventilation under the burner.
 - It is best to remove the LP tank prior to moving. Hard-pipe lines need to have room to flex for small table moving, but large distances need to be disconnected first.

Types: Portable Products

- Not allowed at greater than 15,000 BTU/hr for use on one 16.4 oz. bottle of fuel.
 - 25,000 BTU/hr. for use on two vertical 16.4 oz. bottles of fuel.
 - UL will not cover _____

Attended Appliances

- “Decorative” generally means it should an **Attended** appliance.
- It’s only value is supposed to be the appearance.

Attended Appliances: Why is it important?

- Ensure it is protected from unknown users, especially in commercial areas!
 - Use a safety controller to shut the unit down in the event of performance failure. You do not want raw gas running over an extended period.
- Offer an emergency shutoff
 - Make sure that if the safety shut off is turned back on after use, then the gas cannot begin to flow unknowingly.
- Use protection from contact issues
 - Burner media is hot and critical to burner performance and durability.
 - Children and some adults will want to pick up the “fancy glass beads”.
- Keep the burner clean
 - Bars are a great spot for cigarette butts and other debris and flammables to be added.
 - Affects ignition, generate odors and additional smoke or flames

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.
 - No instruction manual covers everything!
- More difficult areas of the installation could be:
 - Is a screen porch outside or inside? Alcoves with three sides, floor, and roof?
 - Decorative appliances are not unvented appliances. They need a lot of air to operate as designed.
 - If you put it in a porch area today, what happens if windows are installed and then closed?

Installations and Guidelines Continued

- Ceiling Height
 - A ceiling or overhang meeting-required clearances may meet the listing; but materials, such as vinyl soffits, will melt and sag with a fire pit under them if too close.
 - A porch above can become soot black if the burner is burning dirty.
- Vegetation Surrounding the Fire Pit
 - What happens as plants grow and expand? On grass, wood deck, concrete: are there concerns?
 - Non-solid surface such as dirt or grass: the ventilation cannot get blocked by this growth. Adjust to prevent or insure no blockage occurs.
 - Condensation can occur if no vapor barrier is provided.

Clearances to Combustibles

- Follow the instructions. If the system is not listed follow NFPA 211, clearances are generally much larger but the risk of fire is significantly reduced.
- Think about how it may be used and if the settings change.
 - Consider trees, furniture, finishing, and more.

Ventilation

- If a tank is held in the base of the appliance, it is clear that you need ventilation. This is called out in the standard and national codes.
 - Beyond the standard you must ventilate to provide as much protection as possible to the consumer and the appliance.
- Is it important where ventilation is located?
 - Assume at some time gas will escape somewhere under the burner. Ventilation should not be located where you expect someone to be while lighting the system. Ventilation needs to be high and low and provide cross flow.
 - On a deck with gaps: may allow gas to flow out from the base of a unit and puddle under the deck.

Performance and Safety

- Ignition

- There are multiple types in use and available. Because it is an attended appliance, options range from 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.
- When is one better than another? When it is tested and certified! Dust, dirt, bug, spiders, and debris can raise issues. Make sure they are cleaned and ready to light the fire in 4 seconds or less.

- Fuels

- Natural gas and LP dominate this market. Supply lines need to be large enough to supply the burner. Too small of a line can be a major safety issue in its worst case and major time consumer at best.

Performance and Safety: 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 10 mph ignitions and flame stability tests are done.
 - A slight steady breeze is more destructive to a table top material than any other wind condition. It can crack a concrete or granite top in about 30 minutes.
- Rain
 - The rain test is a 15-minute test. After the tests is over, the unit has to operate and perform normally after 13 minutes. Now there is a new test that requires to burn for 15 minutes, then the rain is started. The appliance must shut down safely or continue to operate safely.
 - Protecting the unit from rain will make the appliance last longer and look better over time.
 - Consider overhangs and covers

Performance and Safety Continued

Not everything is as it should be

- Snow
 - Today there is no snow test. The consumer is expected to make sure the appliance is clear of snow and ice.
 - Ice can build over the top of snow or the burner, preventing gas from coming out the ports and exiting the air shutter.
- Dirt, leaves, cigarette butts, etc. need to be cleaned out.



High BTUs relative to indoor appliances

- Air-free CO levels
 - Outdoor 800PPM CO air free is allowed
- Extra components can cause readings to change quickly.
 - Do not add logs to a unit that does not allow them. This will cause soot and high CO levels.
- High gas flow rates generate noises
 - Whistling and swooshing noises
 - Requires good orifice design and custom flex lines
 - Some field corrugated lines can add to noise issues.

Media Varieties

- Tempered chips
- Glass beads
- Lava rock
- River rocks
- Steel balls
- Ceramic balls
- Log sets
- Others

Questions?

