



PARTNERS IN PREVENTION · PARTNERS IN PREVENTION · PARTNERS IN PREVENTION · PARTNERS IN PREVENTION

Solid Fuel Burning Appliances

According to data from the National Fire Protection Association (NFPA), fires involving heating appliances are often caused by the ignition of combustible materials that are located too close to the appliance.

Of significance is that 15% of the fires, involving ignition of nearby combustibles, actually involved the ignition of structural members where chimneys or vent pipes penetrated the building's wall. This highlights the importance of proper installation of all solid fuel burning appliances.

In general, the types of solid fuel-burning appliances include room heaters (stoves), fireplace units, furnaces, boilers, and multi-fuel/side-by-side systems.

Solid fuel-burning appliances may be designed to accept a variety of materials for combustion. Typically, these include wood, coal, and processed fuels in the form of pellets, logs, etc. It is important that only the fuels designated by the manufacturer be burned in these units. Burning of non-approved fuels may result in damage to the appliance, chimney system, and the structure in which it is located.

It is recommended that only a qualified technician install solid fuel-burning appliances.

Installation Considerations

Solid fuel-burning appliances must be installed in accordance to the manufacturer's specification and local building codes. Using a reputable experienced contractor will ensure correct installation.

Clearances

The following are general clearance requirements however there are ULC listed appliances that may have lower clearance requirements. Consult your owner's manual

and installation guide for specific requirements for clearances.

- All solid fuel-burning appliances including chimneys need to be installed with adequate clearances from ceilings (60 inches – 1.50 m), partitions and walls (48 inches – 1.22 m).
- Solid fuel-burning appliances should be installed in rooms that are greater than 512 ft³ (8 feet by 8 feet by 8 feet high).
- All flue pipes must have a clearance of 18 inches (45 cm) from all combustibles.

Floor Protection

Since most solid fuel-burning appliances are quite heavy, precautions should be taken to ensure that floors are capable of supporting the additional load. In addition the floor must be protected from falling embers and radiating heat.

- A floor pad, usually ceramic tile or sheet metal extending 18 in. (45 cm) beyond any side with a loading door, 8 in. (20 cm) on all other sides to protect the floor from falling embers.



Knowing your business matters.

- Protecting the floor from radiating heat depends on the ventilated open space beneath the fire chamber or base of the appliance. Requirements are complicated; NFPA 211 and CSA B365 outline the floor protection requirements. Generally, at least 2 in. (5.1 cm) of ventilated open space must be provided. Legs, pedestals and masonry blocks in certain specifications are usually used to provide adequate protection.
- Floor protection must extend at least 18 inches (45 cm) beyond the appliance on all sides.

Chimneys

The chimney has two principal functions: it creates a draft in the solid fuel-burning appliances for proper burning, and it provides a conduit for the safe removal of the products of combustion to a location outside the building. The flue size, flue shape, flue height, and the material of which the chimney and flue are constructed can all affect the chimney's capability to accomplish these two objectives effectively.

Improperly sized or constructed chimneys can result in inadequate drafts, escape of products of combustion into the building, and dangerously hot chimney fires that can damage the structural integrity of the system and ultimately result in a building fire.

Some guidelines include:

- Chimneys should be as straight as possible and have no offsets that would provide a place for creosote to accumulate.
- Chimneys should have an ash cleanout door that is airtight when closed.
- The chimney outlet should be at least 2 ft (0.61m) higher than any portion of the building that is within 10 ft (3.05m) of it, and at least 3 ft (.92m) above the point where the chimney passes through the roof. These distances are designed to prevent back drafts caused by wind deflection from the roof down the chimney.
- Below the roofline, a chimney should be located inside the building to prevent rapid heat loss to the outside through the chimney's walls. Cool flue temperatures result in increased creosote formation and a reduction in chimney draft.

Factory-Built Chimneys

A factory-built chimney is composed of listed factory-built components assembled in accordance with the terms of the listing to form the completed chimney.

Any factory-built chimney used in a building should be listed. It should be installed in accordance with the conditions of the listing with regard to intended use, maximum height, minimum installation clearances, and type of support.

Chimney Caps

Although any chimney cap will add draft resistance to the chimney system, chimney caps serve two important functions that make their use desirable. First, chimney caps assist in preventing downdrafts where the chimney top is subject to wind turbulence. Second, chimney caps prevent rain and snow from entering the chimney flue and deteriorating or corroding the flue lining. Masonry and steel chimneys are often not provided with a cap at the termination.

Mechanical turbines, revolving ventilators, and other mechanical devices should not be used with a solid fuel-burning chimney system. Such devices are subject to failure due to creosote buildup and corrosion.

In some areas of the country where there are considerable outdoor fire hazards in the vicinity, spark-arresting screens may be required to be installed. The recommended size mesh for spark-arresting screens is 1/2 in (13mm).

Draft

A proper draft is extremely important with solid fuel-burning appliance installations. A poor draft can result in:

- Incomplete combustion of the fuel, which can cause increased creosote formation in the chimney and chimney connector.
- Odors in the living space or sufficient carbon monoxide buildup to cause poisoning of the inhabitants, and
- Back drafts, which can cause a dangerous escape of flame through the fuel door when opened.

Conversely, an excessive draft can result in burning too much fuel, low heat output, and dangerously high flue gas temperatures. Excessive draft is caused by unwanted air

leakage into the appliance resulting in an uncontrolled burning rate. Air leaks usually occur around fuel and ash doors, draft louvers, and the appliance's base.

The obvious solution for an excessive draft problem would be to eliminate air leakage into the appliance.

There are a number of circumstances that can induce a poor draft. The following are possible remedies for an insufficient draft:

- Ensure the damper is open.
- Check the entire system for obstructions, and clean if necessary.
- Check the ash level under the grates of the appliance to be certain it is not too high.
- If wood is burned, make sure it is dry and well seasoned.
- If the appliance only smokes in windy weather, install a chimney cap if one is not provided, or increase the height of the chimney.
- Install the appliance closer to the chimney and eliminate elbows in the chimney connector.
- Try opening a window or door in the same room as the appliance. If this corrects the problem, then a permanent make-up air system should be installed to bring air from other areas to the combustion room.

Other Considerations

- Solid fuel-burning appliances must not be installed in any location where gasoline or any other flammable vapors or gases are present.
- Solid fuel-burning appliances must not be installed in garages.

COPYRIGHT ©2007, ISO Services Properties, Inc.
The information contained in this publication was obtained from sources believed to be reliable. ISO Services Properties, Inc., its companies and employees make no guarantee of results and assume no liability in connection with either the information herein contained or the safety suggestions herein made. Moreover, it cannot be assumed that every acceptable safety procedure is contained herein or that abnormal or unusual circumstances may not warrant or require further or additional procedure.

Partners In Prevention

At Federated Insurance, we believe Loss Prevention is a critical component of your Risk Management Program. Your Risk Services Coordinator, together with our Loss Prevention Team, is available to assist you in developing security measures appropriate for your business. Working together to reduce your loss exposures protects your bottom line!

For more information, contact your Risk Services Coordinator, our Loss Prevention Department at 1-800-665-1934, or visit our website at www.federated.ca

Federated Insurance provides this Loss Prevention Bulletin as a service to our policyholders and their business advisors. The information provided is intended to be general in nature, and may not apply in your province. The advice of independent legal or other business advisors should be obtained in developing forms and procedures for your business. The recommendations in this bulletin are designed to reduce the risk of loss, but should not be construed as eliminating any risk or loss.