

WOOD BURNING STOVES: INSTALLATION AND USE



PREPARED BY THE PETERSBURG BOROUGH, ALASKA

DEPARTMENT OF COMMUNITY DEVELOPMENT

AND

THE PETERSBURG VOLUNTEER FIRE DEPARTMENT

DISTRIBUTED FREE OF CHARGE



INTRODUCTION

This booklet has been prepared to assist you in installing solid fuel (wood) burning appliances in a safe manner. It is **NOT** intended to be a complete installation guide. If you have questions which are not answered by the information contained in this booklet, please call or visit the Borough Fire Marshal's Office in the Fire Station (772-3355) or the Borough Building Official on S. 2nd Street (772-4533) and pay close attention to the manufacturer's specifications and installation instructions for your particular wood burning appliance. Please obtain a building permit from the Borough Building Official if the installation involves any structural changes to your building.

DEFINITION OF SOLID FUEL BURNING APPLIANCES

This term solid fuel burning appliance, as used in this booklet, refers to all solid fuel (wood, coal, peat, etc.) burning appliances including stoves, airtight heaters, radiant room heaters, factory-made fireplaces, fireplace stoves, and circulating room heaters. For readability, solid fuel burning appliances will hereafter be referred to as wood burning appliances.

CAUTION: IT IS NOT SAFE TO BURN ANY FUEL IN AN APPLIANCE OR SITE-BUILT FIREPLACE OTHER THAN THAT FOR WHICH IT WAS DESIGNED. TO DO SO VOIDS THE MANUFACTURER'S LABEL AND WARRANTY, AND COULD BE DANGEROUS.

INSPECTION REQUIREMENTS

After the appliance is installed but not covered, please call to make an appointment for an inspection of the installation by the Borough Fire Marshal (772-3355) or the Borough Building Official (772-4533). Be prepared to show the inspector the manufacturer's specifications and installation instructions for your particular wood burning appliance.

COMBUSTIBLE WALLS

A combustible wall is one which contains any combustible material. It is clear that a wood studded wall covered with plywood is combustible, but so is a wall composed of wood studs covered by sheetrock (plaster board).

NONCOMBUSTIBLE WALLS

A noncombustible wall is one whose entire structure is noncombustible, for example, a concrete block wall stuccoed on the exterior and plastered on the interior.

PROTECTED COMBUSTIBLE WALL

A protected combustible wall is a combustible wall shielded by noncombustible material with at least a one inch air space between the combustible wall and the noncombustible material (**see Figure 1**).

escaping up the flue, resulting in lower flue temperature. Additional inspections and clean-outs may be needed in these types of appliances to assure that creosote is not allowed to build up.

Chimney Fires – Accumulation of creosote in the flue increases the risk of a chimney fire. Combustion of creosote deposits is most likely to occur during a very hot fire in your wood burning appliance, resulting in a very intense fire, a roaring noise, and flames and sparks emitting from the top of the chimney. Any chimney, metal or masonry, can be weakened or deformed by a chimney fire. The complete chimney should be inspected after a fire, and any repairs made and/or parts replaced prior to starting the stove again.

If a Fire Occurs – Follow these steps to reduce your loss:

Call 911, your local fire department, immediately

Close all openings and draft controls on the stove

If the fire is burning vigorously, squirt a multipurpose dry chemical extinguisher or throw baking soda onto the fire in the stove. These chemicals will travel up the chimney and may extinguish the fire.

Avoid introducing water into the chimney. Water could damage the already brittle heated flue liner.

Chimney Inspections and Cleaning – Stove pipes and chimney

flues should be inspected annually before using your stove. Look for cracked flue liners, broken or missing bricks, heavy creosote deposits, bird nests, and other foreign material. Thoroughly clean the flue and stove pipe of any soot and other residues. Also, repair the chimney or replace the stove pipe to avoid problems later in the season. The stove pipe and chimney should be inspected frequently during the heating season for creosote buildup. If you use an air-tight stove check the stove pipe once a month. How often a chimney needs cleaning is determined by how often the stove is used and how it is operated. Should your chimney have excessive buildup, a stiff wire chimney cleaning brush can be purchased for a reasonable cost, or a brush and ladder may be borrowed from the Petersburg Fire Department.

Fire Extinguishers & Detectors – In addition to the extinguishers

already in your home, a multipurpose fire extinguisher should be installed for each stove. The extinguisher should be located near the stove in easy reach. To offer your family additional protection in case of fire, equip your home with an early warning fire detection system.

Special Safety Points –

Because of high temperatures when the stove is operating, locate wood burning appliances out of traffic and away from furniture and draperies.

Alert children to the hazard of high surface temperatures and keep them away from the appliance to avoid burns or clothing ignition.

Carefully supervise young children when they are in the same room as the wood burning appliance.

Do not place clothing or other flammables on or near the appliance.

A qualified person should install and service the appliance and inspect it before use, annually at least.

The "listed" or approved chimney assemblies shall be installed in accordance with their listings. The required clearance from the chimney to combustibles will be indicated on each section of the chimney. Unlisted metal chimneys are only permitted if plans are submitted to the Building Official for approval. Existing or new, masonry or factory built chimneys shall terminate at a point not less than 2 feet above any portion of a structure (roof) within 10 feet horizontal distance of the chimney. This requirement may involve an adjacent structure (see Figure 2).

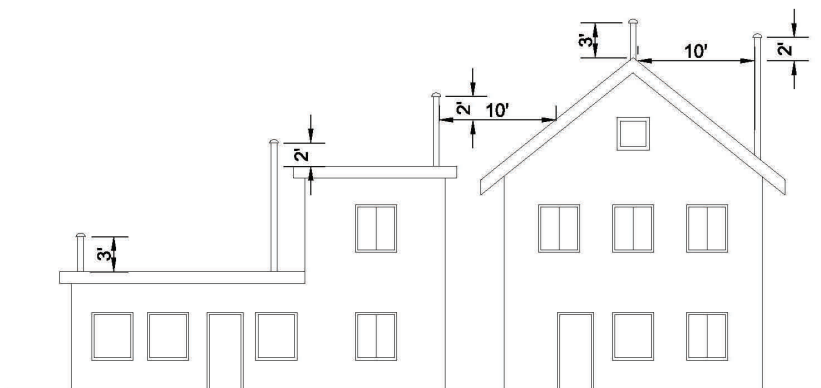


Figure 2: Minimum chimney termination elevations according to NFPA and most building codes

Flue – The opening in the chimney through which smoke passes is called the flue. In general, flue size should be 25% larger than the size of the stove pipe connecting the stove to the chimney. For example, a stove with a six inch diameter pipe would require at least an 8 inch flue. Smoke travels up the flue in a swirling pattern making round flues more efficient than square or rectangular ones which offer more obstruction to the natural flow of smoke. NFPA requirements prohibit connecting a stove to a chimney flue serving a fireplace and recommends that each stove be connected to a separate flue. If 2 stoves are combined into one flue, each should have a separate damper or air-tight capability.

Control Creosote – When wood is burning rather slowly, the smoke usually contains a substance called creosote that collects in the relatively cool chimney flue. The main causes of creosote build-up are:

- Wet or unseasoned wood
- Incomplete combustion
- Cool surfaces

The best method of controlling creosote is to prevent its buildup by maintaining a briskly burning fire with dry, well seasoned wood and by maintaining a flue temperature exceeding 250 degrees F, which will prevent creosote condensation. Some new, more efficient stoves deliver more heat to the room than an open stove or fireplace. These more efficient appliances reduce the amount of heat

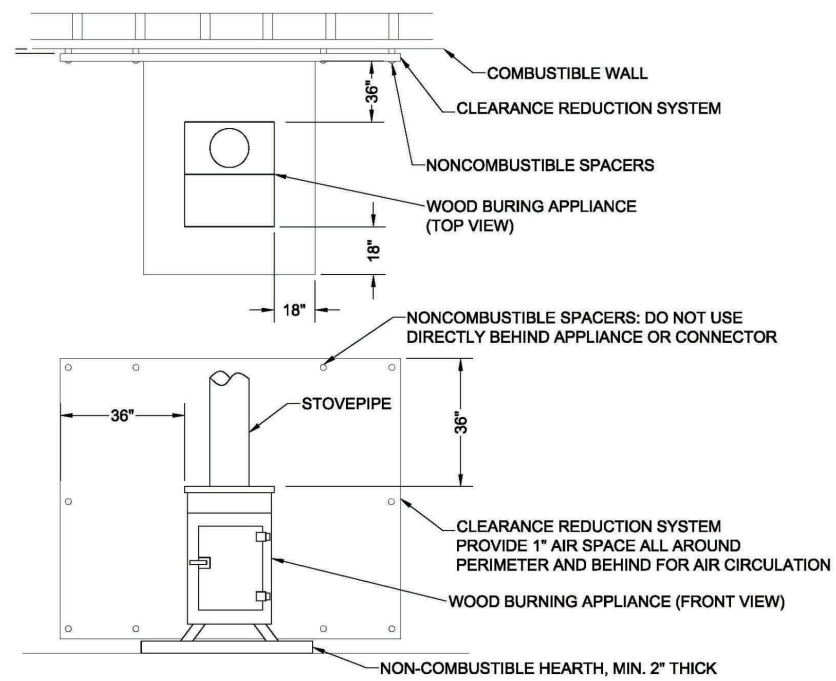


Figure 1

APPROVED "LISTED" VS. UNAPPROVED APPLIANCES

Some wood burning appliances have been thoroughly tested by nationally recognized testing agencies such as Underwriter's Laboratory (UL), Factory Mutual (FM), International Conference of Building Officials (ICBO), and Warnock Hersey. These testing agencies certify that, if the appliance they tested is installed and operated according to the instruction supplied with the appliance, the appliance will be safe to use. Where these approvals exist, the installation of the appliances should be done in accordance with the manufacturer's instructions. The Borough of Petersburg will normally accept these tests and not require further proof of design safety. However, other considerations are necessary for proper installation overall.

Appliances that have not been tested and approved by a recognized agency are required to be installed according to stringent regulations established to assure that minimum distances are maintained between the appliance and any combustible materials, and that noncombustible materials are installed where appliances are likely to be in close proximity to combustible materials (e.g. floors).

CLEARANCES

Radiant type wood burning appliances must be a minimum of 36 inches away from combustibles. Some types of stoves, such as circulators, have been tested

and "listed: for reduced clearances, and may be located closer to combustibles, but generally speaking, most wood burning appliances are required to be:

STOVES.....36 inches from unprotected combustibles

SMOKEPIPES.....18 inches from unprotected combustibles

INSTALLATION REQUIREMENTS

Hearth Slab or Floor Pad – The hearth slab or floor pad for listed appliances shall be as specified in the instructions furnished by the manufacturer. For unapproved appliances, the hearth slab or floor pad shall extend at least 18 inches on all sides of the appliance. When the firebox opening is less than 6 square feet, the clearance may be reduced to 16 inches. It is also suggested that the appliance be supported on sturdy legs of permanent construction providing at least 6 inches of ventilated space above the hearth. The hearth or floor protection shall be at least 2 inches thick and of noncombustible material, for example, a layer of tightly fitting bricks or tile.

Clearances Between Unapproved Appliances and Unprotected Combustible Walls – Radiant type appliances must be placed a minimum of 36 inches away from all combustible material walls and ceilings. Clearances for circulation type appliances are allowed to be reduced to 24 inches from the front and 12 inches from the sides and back. The clearances are summarized in **Table 1**.

Table 1				
Minimum Clearance Dimensions Between Appliance and Unprotected Combustible Material				
Appliance	Clearance Dimension			
	A	B	C	D
	From Top of Appliance	From Front of Appliance	From Sides of Appliance	From Back of Appliance
Circulating	36	24	12	12
Radiant	36	36	36	36

Clearances Between Unapproved Appliances and Combustible Walls –

When a combustible wall is properly protected, the clearances called for in **Table 1** may be reduced to the amounts shown in **Table 2**.

Clearances Between Unapproved Appliances and Noncombustible Walls –

Unless the appliance manufacturer specifies otherwise, the clearance between the appliance and the noncombustible wall may be reduced to zero. It is suggested that even in these cases, at least 1 inch clearance be maintained.

Chimney Connector – Minimum clearances to single wall chimney connectors from combustible material when used with room heaters is 18 inches. Re-

duction of the 18 inch clearance dimension is permitted with approved surface treatments as specified in the International Mechanical Code. Chimney connectors shall not be concealed by building construction unless approved to do so.

Clearance Reduction Applied to and Covering All Combustible Surfaces within the Distance Specified as Required Clearance with No Protection (See 12.6.1 through 12.6.3)	Maximum Allowable Reduction in Clearance (%)		Minimum Clearance			
	As Wall Protector	As Ceiling Protector	As Wall Protector		As Ceiling Protector	
			in	mm	in	mm
(a) 3 1/2 in (90 mm) thick masonry wall without ventilated air space	33	–	24	610	–	–
(b) 1/2 in (13 mm) thick noncombustible insulation board over 1 in (25.4 mm) glass fiber or mineral wool batts without ventilated air space	50	33	18	457	24	610
(c) 0.024 in (0.61 mm), 24 gauge sheet metal over 1 in (25.4 mm) glass fiber or mineral wool batts reinforced with wire or equivalent, on rear face with ventilated air space	66	50	12	305	18	457
(d) 3 1/2 in (90 mm) thick masonry wall with ventilated air space	66	–	12	305	–	–
(e) 0.024 in (0.61 mm), 24 gauge sheet metal with ventilated air space	66	50	12	305	18	457
(f) 1/2 in (13 mm) thick noncombustible insulation board with ventilated air space	66	50	12	305	18	457
(g) 0.024 in (0.61 mm), 24 gauge sheet metal with ventilated air space over 0.024 in (0.61 mm), 24 gauge sheet metal with ventilated air space over	66	50	12	305	18	457
(h) 1 in (25.4 mm) glass fiber or mineral wool batts sandwiched between two sheets 0.024 in (0.61 mm), 24 gauge sheet metal with ventilated air space	66	50	12	305	18	457

Notes:

- All clearances and thicknesses are minimums; larger clearances and thicknesses may be permitted.
- To calculate the minimum allowable clearance the following formula can be used: $C_{pr} = C_{un}(1-R/100)$. C_{pr} is the minimum allowable clearance, C_{un} is the required clearance with no protection and R is the maximum allowable reduction in clearance.
- Refer to Figures 12.6.1 (e) and 12.6.3 (f) for other reduced clearances using materials found in (e) through (h) of this table.

Chimneys – Chimneys shall be constructed of masonry as per International Building Code requirements or shall be approved factory built assemblies "listed" or approved for use with wood burning or other solid fuel appliances.