Furnace heat exchanger leak standards

Allowable amounts of gas leakage from a residential heating furnace heat exchanger

- POST a QUESTION or READ FAQs about the allowable leakage from a furnace heat exchanger, how the lea rate is calculated, how carbon monoxide hazard dangers are calculated inside a building

Furnace heat exchanger leak standards, hole sizes, permitted leakage allowances: this article describes the allowable leakage for furnace heat exchangers, explaining that zero combustion gas leakage may not be achievable.

We review an industry expert's calculations used to determine just how much carbon monoxide leakage is allowable in a building and we translate the allowable gas leakage into an equivalent heat exchanger hole size of abouit 1/8".

We also provide a MASTER INDEX to this topic, or you can try the page top or bottom SEARCH BOX as a quick way to find information you need.

Minimum Hole Size Allowable in a Furnace Heat Exchanger

[Click to enlarge any image]

How much combustion gas or CO leakage from a furnace leak exchanger is allowed? Is there a difference in safety between leakage in a new heat exchanger and leaks that occur in use due to damage, rust, or a crack?

It is almost impossible to construct a heat exchanger that is entirely air tight. Therefore any test method developed to detect flue gas leakage needs to have quantitative aspects.

It would not be desirable to identify as unacceptable any heat exchanger leakage that meets the requirements for heat exchanger joints according to the American National Standards.

Our photograph (left) shows a brand new gas furnace heat exchanger we installed in a New York home. Even this new unit may have trace-levels of flue gas leakage.

What is the Allowable Amount of Gas Fired Heat Exchanger Leakage?

Some gas industry experts (Douglas DeWerth & others) have published studies indicating that in a new gas fired furnace heat exchanger and system, the allowable flue gas leakage rate can be equal to about the leakage expected from a 1/8" diameter hole. This effort at making a reasonable standard recognized that there could be safe imperfections in heating system manufacture. [1] through [11].

- **Studies such as DeWerth** (1991) (**HEAT EXCHANGER LEAK ALLOWED**)[1] and standards such as published by AGA (american gas assoc) may define the "allowable leakage" from a heat exchanger, but DeWerth's "1/8 equivalent leak hole size" standard quote by Friedman in the ASHI Technical Journal article was intended to address the condition of NEWLY manufactured units and assumed particular equipment size, room size, air movement etc. that may not pertain to an in-use older or damaged heating system.
- **The actual leakage from a crack or hole in a heat exchanger** depends on variables during operation as well as its location - for e.g. when a blower is running air may go into the combustion chamber through the crack rather than the other way around.
- We expect that heating service technicians who examine a furnace for unsafe heat exchanger leaks as well as the furnace manufacturers will advise that if a crack has occurred the unit needs repair or replacement. (Sometimes repair by welding may be acceptable but it's doubtful).
- Ultimately ANY crack in a heat exchanger that was caused by wear and tear or some event like improper operation is potentially dangerous because we don't know that it won't suddenly increase in size or change how it leaks flue gases into the building air as operating conditions change. So even a small leak, depending on its cause (acceptable manufacturing defect versus a crack or rust hole) might be unsafe.

  For that last reason we'd be surprised if any HVAC contractor would risk the lives of the occupants (nor a lawsuit) by saying leaving the unit in place is OK.

Analysis of Furnace Heat Exchanger Gas Leak Standards

The standards for Gravity and Fan Type Direct Vent Wall Furnaces (Z21.44.1981), and for Direct Vent Central Furnaces (Z21.64-1978), requirement for tight joints in heat exchangers is met if the combustion chamber-vent section does not leak more than 2% of the flue gases. This test is conducted with the internal pressure of the heat exchanger raised to 0.1 w.c. static pressure.

The leakage from the minimum allowable hole is calculated from:

size 12 L sub C = .02^V^I> where:

size 12 L sub C = maximum allowable flue gas leakage rate, cubic feet per hour,

size 12 V - 15 cubic feet of flue products per 1000 BTU, assuming 50% excess air,

size 12 I - Input rate, 1000 BTU/hour For an 80,000 BTU/hour furnace:

size 12 L sub C = left ({.02} right) left ({15} right) left ({80} right)

size 12 L sub C = 24 cubic feet per hour of flue gases allowed to leak.

See HEAT EXCHANGER LEAK TEST STANDARDS

Figuring the diameter of a heat exchanger leak opening from the area concentration of leaked gas that will occur as a result

It is possible to calculate the hole size needed to leak 24 cubic feet of gases using an orfice flow equation assumed equal to a particular c specified opening diameter. Passing 24 cubic feet of flue gases per hour would require a leaking orfice of 0.051 sq.in. For a pressure drop across the orfice of .4 inch w.c. the orfice would be 0.025 square inches.

Watch out: when inspecting and testing furnace heat exchangers for leaks, don't forget to look for other flue gas or carbon monoxide leak sources such as shown in our photo at left. Failure to observe a gross safety hazard such as this one risks focusing on the wrong hazard.

0.51 sq.in. computed Leak Opening for a Furnace Heat Exchanger

The diameter of an orfice for .051 sq.in. was found to be the computed size of an acceptable equivalent total flue gas leakage opening as follows:

DeWerth [8] used a desired rate of flow in cubic feet per hour, a constant of 1658.5 to convert units, a .9 orfice factor, the area of the orfice in sq. in., a pressure drop across the orfice of 0.1 in. w.c. - which is conservatively high for all but power burners, and the specific gravity c flue gases assumed equal to 1.

Passing 24 cubic feet of flue gases per hour would require a leaking orfice of 0.051 sq.in. For a pressure drop across the orfice of .4 inch w.c. the orfice would be 0.025 square inches.

The diameter of an orfice for .051 sq.in. is computed as follows:

Square root of (4 x Area divided by Pi), as .254 in. and the diameter of an orfice of .025 sq.in. is .180 in. [GRI 84/0162 p. 10]

1/4" diameter Hole in a Heat Exchanger - Unacceptable at 80,000 BTUH example

This calculation implies that it would take a 1/4 inch diameter hole in the heat exchanger to leak an unacceptable amount of flue gases for our example of an 80,000 BTUH furnace with an internal pressure of 0.1 inch w.c.

In an effort to select a conservative condition in the development of the test method, a 1/8 inch hole was selected as the minimum size hole that should be detected. A hole with one half the diameter results in an area one fourth that of the 1/4 inch diameter hole, which woul reduce the flow by a factor of four according to the orfice equation. [2].

Maximum Leakage Allowed in a Furnace Heat Exchanger

After conservatively determining that the minimum hole size representing an unacceptable condition was a 1/8 inch diameter hole, it was necessary to select the maximum CO concentration to be allowed in the flue gases leaking through the 1/8 inch hole.

A 100% safety factor was used on the maximum 400 ppm air-free CO allowed by the American National Standards for Furnaces Z21.47-1983. Thus, 200 ppm air-free CO was used as reference for detection.

The appropriateness of the selection of 200 ppm CO can be verified using an analysis based on the maximum allowable room concentration of CO. An equation was developed

Carbon Monoxide Hazards From House Heaters Burning Natural Gas, G.W. Jones, et al., Technical Paper 337, Department of the Interio Washington, D.C. 1923. which relates the room concentration to emission levels over time. Figure 1 [next page] shows this equation together with all the involved factors.

From this equation it can be seen that if assumptions can be developed to define

size 12 CO sub A , size 12 N,V, > < >and

size 12 R> < >it would be possible to calculate

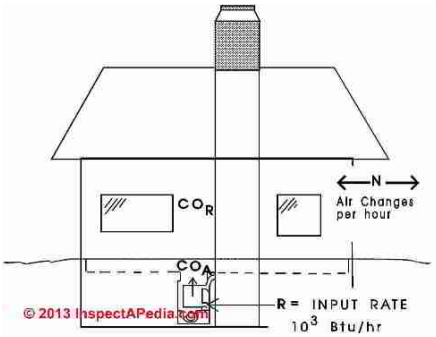
size 12 CO sub R> < >after a time

size 12 T > < >< >representing equilibrium. The

size 12 CO sub R > < >value would be the CO concentration in the house at equilibrium.

Editor's note: the equation computes COR, the CO in the room, in ppm, based on the CO in air-free products of combustion ppm, the number of air changes per hour in the room, the volume of the room, the volume of dry air-free combustion products per 1000 BTU of fuel burned (8.52 cu. ft. for natural gas), the burner input rate in BTU/hr., a Naperian logarithmic base of 2.7133, and T, the time needed to reach a given concentration (of CO) in hours.

House Air Changes Per Hour in a Building Related To Furnace Heat Exchanger Leak Standards



A review of literature on tightness of house construction was used to determine a value of

[Click to enlarge any image]

size 12 N> , room air changes per hour.

size 12 CO sub R = {CO sub A left ({1 - 1 over e sup NT} right)} over NV >
where

size 12 CO sub R> = CO in room, ppm

size 12 CO sub A> = CO in air-free products of combustion (in FAF duct), ppm

size 12 N> = Number of room air changes per hour

size 12 V> = Volume of room, cubic feet

size 12 P> = Volume of dry air-free combustion products, cu. ft. per 1000 BTU of fuel burned (8.52 cu. ft. for nat. gas)

size 12 R> = Input rate, thousands of BTU/hr.

size 14 e> = Naperian logarithmic base (2.7133)

size 12 T> = Time to achieve a given concentration, hours.

A great deal of what is written on house infiltration cites an old rule of thumb that leakage rates vary from 0.5 to 1.5 air changes per hour (ACPH) and average about 1.0 ACPH.

This overall average is shown in the ASHRAE Handbook of Fundamentals and is also used by the EPA in its proposed text for inclusion ir DOE's rule making for the Residential Conservation Service (RCS) program.

The current generation of houses being built, however, appear to have an average infiltration rate between 0.6 and 0.86 ACPH. Assuming that the average ACPH for houses built two decades ago had an average of 1.0 ACPH, the average has dropped 15 to 20 percent over that time. Current air infiltration studies generally support the 0.6 to 0.86 ACPH figure.

Gas furnace heat exchanger leak research

- Natural Ventilation of Modern Tightly Constructed Homes, AGA/LIGT Conference on Natural Gas Res. & Tech., Chicago, IL, July 1982.
- Air Leakage Characteristics and Weatherization Techniques for Low Income Housing, DOE/ASHRAE Conference on Thermal Envelopes, Orlando, FL December 1979.
- Residential Air Infiltration , ASHRAE Technical Paper, Philadelphia, PA 1979
- Building Energy Data Compilation Analysis and Demonstration , DOE Contract W-7405-ENG-48, Lawrence Berkeley Laboratory, 1980.

[Discussion of contents of the references by the author is in his original report.]

House Air Change Rate

Based on the above data and references, a realistic, conservative house room air change rate would be 0.5

size 12 (N = 0.5 size 12)>

House Volume: A small house with 9000 cubic feet (1125 sq.ft. x 8 ft. ceiling) was assumed.

size 12 (V = size 12 9000)>

Furnace BTU Rate: The house was equipped with an 80,000 BTU/hour furnace with a 50 percent load factor.

size 12 R = size 12 .50(80,000)>

Flue Gas Spillage Destination: 100 percent of the flue gases generated were assumed to spill into the house (which would never occur under realistic conditions)

Time to Equilibrium: From exercising the equation it takes about eight hours for equilibrium conditions to be reached.

size 12 T = size 12 8>

CO Level at Equilibrium: size 12 CO sub R = {(200) (8.52) (40) left ({ 1 - 1 over {e sup (.5)(8)}} right)} over {(0.5) (9,000)}>

size 12 CO sub R = size 12 14.9> < >ppm.

Using the size 12 CO sub R> < > equation above, this would mean that after a period of eight hours the house CO concentration would be no more than 15 ppm.

Allowable CO Exposure in buildings

The CPSC, in its report on Health Effects of Carbon Monoxide evaluated the scientific basis for suggesting long term exposure limit for CO and concluded that the value should be no more than 15 ppm as a time weighted average. OSHA Concentration Limits for Gases as shown in the Federal Register (Volume 39, Number 125, 6/27/74) specifies a maximum eight hour weighted average of 50 ppm. Much higher than the 15 ppm allowed here.

The American Conference of Governmental Industries Hygienists also discusses their recommended Threshold Limit Value of 50 ppm in Documentation of the Threshold Limit Values (3rd Ed., 1971). This source also reports that the CO limit in the USSR is 18 ppm and in Czechoslovakia 30 ppm.

Therefore by developing a leak detection method that would allow no more than 200 ppm CO to leak from a crack or hole in a furnace heat exchanger the home environment should remain safe if 100 percent of the emissions from a properly adjusted furnace were released into the indoor air.

Specification of the Test Gas for Detecting Heat Exchanger Leaks

A mixture of 14.3 percent methane in nitrogen was used as the tracer gas as this mix cannot be diluted in air to obtain a combustible mixture.

[We've omitted an interesting but lengthy section which explains the reason for selection of the particular test gas, including an explanatio of why certain concentrations of combustible gas, including high concentrations, will not support combustion (insufficient oxygen).-Ed.]

[Note that some heat exchanger test procedures make use of refrigerant gases, products readily available to the tradesman and easily detected (though not quantified) using a test instrument such as the TIF 5000 shown at left and discussed in detail at TIF 5000 GAS DETECTOR.

Watch out: refrigerant gas detection by release into a heat exchanger as a tracer gas if used to check for heat exchanger leaks - is something no longer recommended nor permitted where discharge of refrigerants to the environment is a possibility.

Description of the Test Procedure for Heat Exchanger Leaks

The developed method traces the migration of 14.3 percent methane in nitrogen from the combustion side to the air side of the heat exchanger.

The presence of the gas mixture in the circulating air side is detected with a combustible gas detector which is calibrated to respond to about 200 ppm CO, the maximum leakage concentration chosen.

Figure 2 shows the set-up for the Three-Step Method. [DeWerth]

Step One - Visual Inspection

Step One is to conduct a thorough visual examination of the heat exchanger. Clean any loose particles on the visible surfaces of the heat exchanger, use a mirror and a strong flashlight. Inspect the internal sections for signs of split seams, open cracks, severe deterioration.

Examine joints between flue gas passages of the heat exchanger and other parts of the furnace. If construction is such that a portion of th heat exchanger or radiator is in the cold air return compartment, special care should be given when examining these parts.

Access for visual inspection of the heat exchanger is frequently limited by evaporator coils, etc. therefore a removable inspection plate, access panel, or heat register on the plenum would be helpful to visually examine the exchanger from the air side. Any visible crack or hole in the heat exchanger is reason for requiring repair.

Step Two - Flame Observation

The furnace is then turned on and Step Two: an observation of the flames before and after the circulating air blower comes on is made. After the unit is hot, the gas and electrical power to the furnace are shut off (the blower is not operational for the rest of the test).

Observe the flame pattern for floating flames and flame rollout or any flame distortion. These observations indicate a possible split seam, open crack, severe deterioration of the heat exchanger or mechanical separation of the heat exchanger from the jacket. Disturbance of th flame by the blower is a reason for requiring repair of the heat exchanger.

Step Three - Tracer Gas

Step three is then performed: the tracer gas is injected into the combustion chamber and the calibrated gas detector is used to check for the presence of methane on the air side of the heat exchanger.

Prepare an access hole in the plenum over the heat exchanger, as close to the heat exchanger as possible. If you cannot get within 3 inches, any opening as close as possible will be acceptable but you'll have to allow more time for reaction.

Allow the furnace to operate at least 5 minutes, then quickly conduct the rest of the procedure while the heat exchanger is warm.

Check the vent connector for any blockage

Turn off the main burner and pilot and power supply to the unit

Insert the gas detector probe into the selected area in the plenum and null out any background disturbance

Place the injector probe for the tracer gas in the bottom of a heat exchanger section. Adjust the flow rate of the tracer gas to seven cubic feet per hour. Maintain this flow rate through the balance of the test. For multiple section heat exchangers do one section at a time.

As the heat exchanger is flooded move the gas detector probe to cover the top of the heat exchanger section for at least two minutes.

If an unacceptable leak is present the calibrated indicator

If the tic rate increases during the probing period but the light does not go on, there is no unacceptable leak. But it may be desirable to further investigate if the tic rate increase is substantial.

If the light goes on, the leakage rate is unacceptable and the source of the leak should be investigated by further probing. This is a reasor for requiring replacement of the heat exchanger.

Repeat the procedure for the remaining heat exchanger sections

Any access openings made in the furnace plenum to conduct the test must be closed or sealed.

If no reason for corrective action is indicated, re-light the pilot and turn the furnace back to its ready condition in accord with the manufacturer's rating plate or instructions. Seal the hole in the plenum with a small piece of sheet metal.

Combustible Gas Detector Specifications & Where to Buy a Combustible Gas Detector

- Alkaline battery, low battery indicator light, hand held, portable, maximum weight two pounds.
- Warm up time maximum 30 seconds.
- Maximum operating temperature for probe and instrument: 150 °F.
- Must detect CH4 and CO.
- Calibration: internal is desirable with a tick indicator at a low level (less than 20 ppm CO); an indicator light for a low level (200 ppm) of combustible gas; an alarm light and audible signal at 50 percent of the LEL for gas leak detection.
- Calibration should be plus or minus 5%.

The combustible gas detector can be purchased from

- Drager GAS DETECTORS - Draeger Instruments, shown at left
- GAS DETECTION INSTRUMENTS - separate article
- TIF 5000 GAS DETECTOR - separate article
- J&N Enterprise, PO Box 188, Wheeler IN 46398 219-759-1142
- Pragmatics Inc., PO Box 737, Manchester MO 63011 314-225-6786
- Sierra Monitor Corporation, 1050K Duane Ave., Sunnyvale, CA 94086 408-746-0188
- The calibration gas (200 ppm CO/N2) and working tracer gas (14.3% CH4/N2) from Matheson, Dayton OH 45424 513-236-3021
- AIRCO, Chicago, IL 60628 312-468-4200.

References

- HEAT EXCHANGER LEAK TEST STANDARDS
- American Gas Association, 1515 Wilson Boulevard, Arlington, VA 22209
- Gas Appliance Manufacturer's Association, 1901 North Fort Myer Drive, Arlington, VA 22209
- Gas Research Institute, 8600 West Bryn Mawr Avenue, Chicago, IL 60631
- Douglas W. DeWerth, P.E. is an ASHRAE Member and is Group Manager, Residential Appliances/GATC, Research and

Development, for the American Gas Association in Cleveland, OH. Readers should also note two relevant and interesting articles provided to the Journal by R. Matzen and A. Carson, respectively:

- John N. Kirkpatrick, MD, Occult Carbon Monoxide Poisoning,The Western Journal of Medicine , (January 1987 146:52-56) available from the author, The Mason Clinic, PO Box 900, Seattle, WA 98111-0900
- F. Steel, Airtight Houses and Carbon Monoxide Poisoning,Canadian Building Digest , Division of Building Research, National Research Council Canada, Ottawa, Canada K1A OR6 ISSN 0008-3097 UDC 614.8:728 pages 222-1 - 222-4.

Reader Q&A About Heat Exchanger Leak Test Allowances

Question: Strong winds may overcome exposed direct vent chimneys or flues for heating appliances?

Concerning sidewall power vent to one of my residential gas furnaces. It is a proper code compliant side vent sloped properly with condensate drain etc. However, it is on a wall exposed to a wide open area - thus winds can be strong against the house. Do I need to install something like an open vent collar to reduce the back pressure variations caused when winds are heavy? - Sack from VA 12/2/12

Reply:

Sack

Interesting question, I don't know but if you can tell us equipment brand and model we will research the question - or you can all the the manufacturer who can tell us.

I've never seen a power vent with wind protection installed, and we have presumed that the blower fan that provides positive draft for the direct-vented heating appliance is designed & tested by the manufacturer to provide more than adequate draft provided that you have followed the manufacturer's installation instructions. Those instructions typically state that

The combustion air intake shall be installed upwind of the vent outlet when exposed to prevailing winds.

Avoid locating the vent terminal on a wall facing prevailing winds and wide-open areas. When impractical, choose a location that protects the vent from strong winds, such as behind a fence or hedge. [15]

Do you have a copy of the installation instructions and can you give the brand and model of your heating appliance?

Question: what is the required clearance between adjacent houses & a neighboring direct vent fireplace?

Is there a minimum distance between brick houses in Toronto for venting termination of a fireplace using direct vent? - A.W., 12/30/2012

Reply:

I have not found building code citations that refer to nearby or adjacent buildings when specifying clearances for direct vent fireplaces, bu it seems likely that your local building code inspector would agree that the clearance requirements for the building in which the fireplace is installed would set the minimum acceptable clearances that would then apply also to a nearby or adjacent building.

In other words, if the fireplace vent distances and position relative to your own building windows or doors were LESS THAN those to the windows & doors on the building where the fireplace is installed, and presuming for a moment that the fireplace was installed properly, meeting local building permit and code requirements, then a violation probably exists.

If the fireplace vent distances and position relative to your own building windows and doors is GREATER THAN those to the windows and doors where the fireplace is installed, and presuming for a moment that the fireplace was installed properly, meeting local building permit and code requirements, then a violation probably does not exist.

Take some some sharp photos of the installation that concerns you, or make a sketch and send those along and we may be able to comment further.

Thanks to Alan Carson, Carson Dunlop Associates, Toronto, for assistance with this topic.

Question: neighbor's power vent 18" from power line

(Mar 8, 2014) James S said:

My neighbor just installed a power vent for his furnace on the outside of his house. The house is 18" from the property line (this is a grandfathered non-conforming setback), but the new very loud power vent extends a further 10" into the space, so stops 8" from the property line. Is it ok to extend into the non-conforming set back like this when the code says they can't build 3' from the property line?

Reply:

James,

Good question, for which I don't have a sure answer; this is a question for your building department.

Most communities indeed have restrictions on just what can be close to the property line, with variations depending on whether you're considering a front, side, or rear property boundary. Keep me posted.

Question: clearance distance from direct vent furnace exhaust to clothes dryer exhaust vent

(Apr 8, 2014) Paul T said:

what is the clearance for a direct vent furnace to a dryer exhaust vent?

Reply:

Paul I'm not aware of a clearance specification between the furnace and a dryer exhaust vent, and I'm not sure if your question is distance to the vent pipe or distance from the direct vent furnace combustion air intake or distance from its exhaust, or distance from the heating appliance itself.

But I'd say that ANY dust emitting source close to any fuel burning appliance is a concern if the dryer lint can enter or clog combustion air inlets (very dangerous where carbon monoxide may be produced) or other air vents such as cooling vents on equipment.

I can suggest two approaches to getting past speculative arm-waving:

1. if you see dryer lint in or on the appliance that's a potential safety concern that needs to be addressed

2. Check with the appliance manufacturer directly, for the particular brand and model of heater, starting with a review of its installation instructions and if needed a call to the manufacturer.

Watch out: if your clothes dryer were a model whose air *intake* were at risk of drawin in combustion products that would be a dangerous situation.

Question: repairs for Sears Homart® direct vent gas fired wall-mount furnace

(May 18, 2014) Anonymous said:

I have an old Sears Homart Direct Vent Gas Fired wall furnace model #867.72542
It has worked well for 29 years with only the fan being replaced 3 times. As of late, it has been getting so hot behind the front panel that the wires going to the 2 limit switches are melting causing smoke. I'm not sure how to fix this or what the problem is. Any suggestions would be greatly appreciated. I can't seem to find anybody that knows anything about these old Homart furnaces. Anteup711@aol.com
Lawrence Markowski

Reply:

Lawrence

The overheating you describe is dangerous and suggests backpressure in the combustion chamber. I'd expect that to happen if the syste has not been properly serviced or adjusted and/or in particular if the exhaust venting is blocked or not working properly.

Shut off the system and ask your heating service technician to diagnose and repair the cause for overheating. Any overheated switches and wiring should be replaced as well, as if they're damaged the system is unsafe and risks a fire.

The problem is not one likely to be unique to the Homart Furnace.

Finally, if the total proposed cost of repairs is a significant portion of the cost of a new furnace, I'd give that option consideration.

Question: direct vent Weil McLain gas boiler may be too close to neighbor's windows

(July 17, 2014) Concerned said:

A neighboring house has a Weil-McLain gas-fired boiler with a sidewall direct vent that is directly across from the window of my 3' x 4' powder room. There is less than 9 feet between our houses- 7 feet on his side and 2 feet on my side of the property line. If I open my window, you can see the condensation come in through the window. You can smell and taste it

. I put a carbon monoxide meter on the windowsill and got a reading of 15. I called the company and they originally told me that there is n specification as far as a required distance from the vent to a window and that exhaust is being emitted and that the city should follow code I called the inspector and he told me that it should be 10 feet and that it had to be corrected, but it was a "sensitive issue" because they passed the inspection. After about a year and various phone calls he told me that according to the 2009 International Residential Code th manufacturer's instructions needed to be followed which requires 6 feet from an adjacent wall- no mention of a window- which brings this around to the beginning again.

I read a copy of the instructions and on the very first page it has a warning saying "Perform steps in the order given. Failure to comply could result in severe personal injury, death or substantial property damage." There is a section which comes before any clearances are given which says,

"Consider the surroundings when terminating the vent: Position the vent where vapors will not... be objectionable. Avoid possibility of accidental exposure of flue products with people or pets."

These are just 2 of the 7 considerations that should be given before proceeding to the clearance distances. Again I called the company and they told me that they would not guarantee the safety of this exposure and that I should keep my window closed. I met with a lawyer and he told me that it was a trespass on my property and that I would have to take my neighbor to court and not the installer. I talked to m neighbor about it, but no response. What to do?

Reply:

Concerned,

If the neighbor is not interested in addressing this concern, and before launching a costly lawsuit that will upset everyone for some time, I' try speaking with your local building department. If your local code officials agree that the installation you describe is improper and violate local building ordinances that alone may be enough to encourage the neighbor to change the installation as needed.

Question: clearance distance between direct vent propane fireplace exhaust and oil storage tank

(Aug 26, 2014) Elsbeth said:

Is there a required clearance for a direct vent from a propane fireplace and an outside oil tank? Thanks

Reply:

Elsbeth

I'd respect the same distance for oil storage tanks as that required for clearance from the oil burner, since like an oil burner, a propane fireplace will involve flame - that's ten feet from the burner - which is not the same as 10 feet from the vent.

Propane tanks also have clearance requirements, typically ten feet

Reader follow-up:

Thanks for your response- Are there any requirements preventing an oil tank being in close proximity to a propane tank? We're moving and want to install a propane fireplace and the oil tank is outside near the living room wall which is where we want the fireplace.

Question:

9/8/2014 Pam said:

We had a natural gas boiler installed in our house to replace a diesel burning unit. We asked that the new boiler be vented through the old chimney but the installer said that the new gas water heater was vented through there and that only one appliance could be vented through the chimney. We live in Alberta and from everything i have read my understanding is that 2 gas appliances through one flue is no problem so long as they don't exceed the max BTU output. .please confirm or correct.

Also, I have been reading here on testing new systems for leaks. please let me know how that test is performed as I don't think it was don here. Yesterday I noticed an exhaust leak where the pvc didn't meet the outside wall vent cover and liquid was leaking down the siding of the house. That and other issues with the installation has made me lose confidence in the installer and now want to make sure all was done correctly.

Reply:

two appliance through one flue .... "is no problem " may or may not really be the case. In addition to total BTUs vs. chimney venting capacity there are guidelines for how appliances are connected and how their draft hoods are arranged. If done wrong, for example, a higher BTU appliance can back-vent out through the smaller appliance flue vent connector, particularly when the smaller one is OFF,

Also venting a small appliance into a large chimney can cause it to fail to vent properly when it's running alone - the chimney may be too big and too cold to develop proper draft.

In sum, you want a qualified chimney or gas appliance technician to be sure that the installatin is correct and safe If not the CO risk can b fatal.

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Or see these

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- BACKDRAFTING HEATING EQUIPMENT
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(Oct 13, 2017) **danjoefriedman (mod)** said:

Ruth

Yes and no and maybe - sorry for the arm-waving but really it depends. As Mark Cramer says.

It is often possible to replace the heat exchanger of a heating appliance, though the labor may make the job not cost-reasonable compared with installing a new heater.

If the hole is actually in the combustion chamber, not the heat exchanger

1. STOP USING and TURN OFF the heater immediately as it is unsafe and you risk a building fire.

2. Depending on the problem the combustion chamber may be repairable. For example there are combustion chamber liner kits that are suitable for SOME applications.

Sorry but beyond that, knowing nothing about your heater, I can't be more specific. You're welcome to use the page bottom or top CONTACT link to send photos if you've got images of the actual damage.

(Oct 13, 2017) **Ruth R** said:

Is an old gas wall heater with a large hole in the combustion chamber repairable?

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