

Installation and Maintenance Instructions

Saf-T Vent[®] Model EZ Seal and Model GC

Single Wall
AL 29-4C Stainless Steel
Gas Vent Connector
Chimney Liner &
Special Gas Vent (USA) / Type BH Vent Class I/II (Canada)

For Venting Residential, Commercial & Industrial Appliances
Category I, II, III & IV Appliances

Model EZ 6"-16" Diameter Vent for use on Positive, Neutral and Negative Pressures up to 9" W.C.

Model GC 18"-32" Diameter Vent for use on Positive, Neutral and Negative Pressures up to 15" W.C.

Important: Do NOT install this product until you have read and fully understand these installation instructions. Failure to comply with these instructions may result in injury or damage to property. An improper installation will void any stated warranty.

- Follow these instructions exactly as written.
- Examine all components for possible shipping damage prior to installation.
- Proper joint assembly is essential for a safe installation. Check integrity of joints upon completion of assembly.
- This venting system must be supported in accordance with these instructions.
- Check for restricted vent movement through the walls, ceilings and roof penetrations. This venting system must be free to expand and contract.
- Do not mix Saf-T vent pipe with pipe from different manufacturers.



Tested and Listed to
UL1738 & ULC S636
By Underwriters Laboratories, Inc.

 **WARNING**

Failure to follow the installation instructions could cause FIRE, CARBON MONOXIDE POISONING, OR DEATH. If you are unsure of installation requirements, call (800)-922-8368 or visit www.selkirkcorp.com.



APPLICATION INFORMATION

Saf-T Vent Model EZ Seal and Model GC Gas Vent Systems may be used to vent safety certified Category I, II, III, IV and Certain Direct Vent gas appliances with a flue gas temperature of not more than 550° F (288° C). The Saf-T Vent EZ Seal system is for use with appliances which produce positive vent pressures of 9 inches of water column or less and Model GC is for use with appliances which produce positive vent pressures of 15 inches of water column or less. Because these types of appliances may produce vent gases under positive pressure and/or at or near their dew point, special installation considerations may be required.

Install in accordance with these instructions and those of the appliance manufacturer. Consult the appliance manufacturer's instructions for the maximum horizontal length of the vent connector as well as any restriction on total vent height, proper sizing of the vent, common venting considerations and procedures for connecting the vent to the appliance.

The installation must conform to applicable National, Regional, State and local codes. Contact the Authority Having Jurisdiction prior to beginning any work to obtain any required permits.

Pre-Installation Considerations:

Proper planning prior to installation is essential for maintaining proper clearances and for avoiding possible contact with concealed plumbing or electrical wiring inside walls, floors and ceilings. A continuous straight-line pitch of at least 1/4 inch (2 degrees) rise per foot on horizontal runs must be maintained in order to properly rid the system of the corrosive condensate. Be sure to plan a sufficient number of supports for the entire system to maintain the required straight-line pitch and to hold the system in place.

Personal Safety

Wear eye protection and heavy gloves throughout the installation. In addition, wear an approved dust and vapor respirator whenever in contact with building insulation. Proper and safe scaffolding and/or ladders should be used. Check overhead for antennas, power lines or other obstacles before erecting ladders or scaffolding and while working with conduit on any roof structure.

Tools Required for Installation

Common building tools including but not limited to a Tape Measure, Pliers, Screw Drivers, Saws and/or Snips, Drills, Drop Cloth(s); Ladder/Scaffold; Safety and Personal Protective Clothing.

Definitions:

AL 29-4C - A super ferritic stainless steel alloy designed by Allegheny Ludlum for extreme resistance to chloride ion pitting, crevice corrosion and stress corrosion cracking. Equivalent material made by other manufacturers may be identified by the UNS designator S44735.

Category I Appliance - An appliance which operates with a non-positive vent static pressure and with a vent gas temperature that avoids excessive condensate production in the appliance.

Category II Appliance - An appliance which operates with a non-positive vent static pressure and with a vent gas temperature that may cause excessive condensate production in the appliance.

Category III Appliance - An appliance that operates with a positive vent static pressure and with a vent gas temperature that avoids excessive condensate production in the appliance.

Category IV Appliance - An appliance that operates with a positive vent static pressure and with a vent gas temperature that may cause excessive condensate production in the appliance.

Combustible Material - Any material made of or surfaced with wood, compressed paper, plant fibers, or other materials that are capable of being ignited or burned. Such material shall be considered combustible even though it is flame proofed, fire-retardant treated, or plastered. (Source: NFPA54/ ANSI Z223.1-2006.).

Clearance to Combustibles and Framing Requirements

Table 1 shows the required MINIMUM AIRSPACE CLEARANCE TO COMBUSTIBLES. "Combustibles" include framing lumber, drywall, plywood, paneling, insulation, wiring and other building materials. This airspace clearance is required for safe operation of the vent. Failure to follow these clearances could overheat the building materials and could cause fire.

Pipe Size	Max Appliance Operating Temperature	Orientation	Minimum Airspace Clearance to Combustibles	Minimum Framing Dimension Through Joist (Vertical or Horizontal Penetration)
6-10"	300°F	Vert. or Horiz.	1"	N/A (Gas Vent Connector Only)
6-12"	550°F	Vert. or Horiz.	2"	(ID + 5") X (ID + 5")
14"	550°F	Vert. or Horiz.	3"	(ID + 5") X (ID + 5")
16"	550°F	Vert. or Horiz.	4"	(ID + 5") X (ID + 5")
18"	550°F	Vert. or Horiz.	4"	(ID + 9") X (ID + 9")
20-22"	550°F	Vert. or Horiz.	5"	(ID + 9") X (ID + 9")
24-26"	550°F	Vert. or Horiz.	6"	(ID + 9") X (ID + 9")
28-32"	550°F	Vert. or Horiz.	7"	(ID + 9") X (ID + 9")

Table 1. Minimum Clearance to Combustibles

Vertical (Floor, Ceiling and Roof) Penetrations

All vertical penetrations where the vent passes through a combustible floor, ceiling or roof require a Joist Shield or Roof Jack be installed. See Table 1 for proper framing dimension and refer to the Joist Shield or Roof Jack Section for proper installation. Non-combustible Floor, Ceiling & Roof Penetrations do not require a Joist Shield or Roof Jack.

Horizontal (Wall) Penetrations

All horizontal systems passing through a combustible wall require the use of a Wall Penetration. See Table 1 for proper framing dimensions and refer to Wall Penetration section for installation instructions. Non-combustible wall penetrations do not require a Wall Penetration.

TYPICAL INSTALLATION CONFIGURATIONS

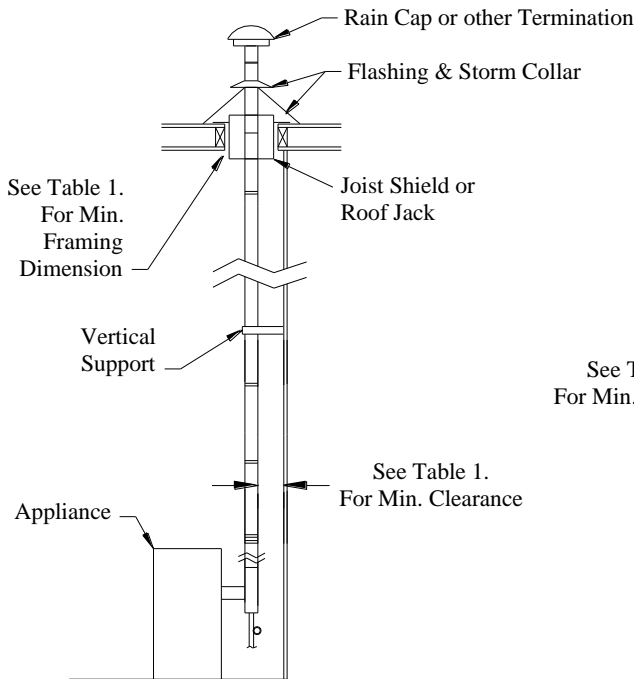


Fig 1. (Vertical Termination)

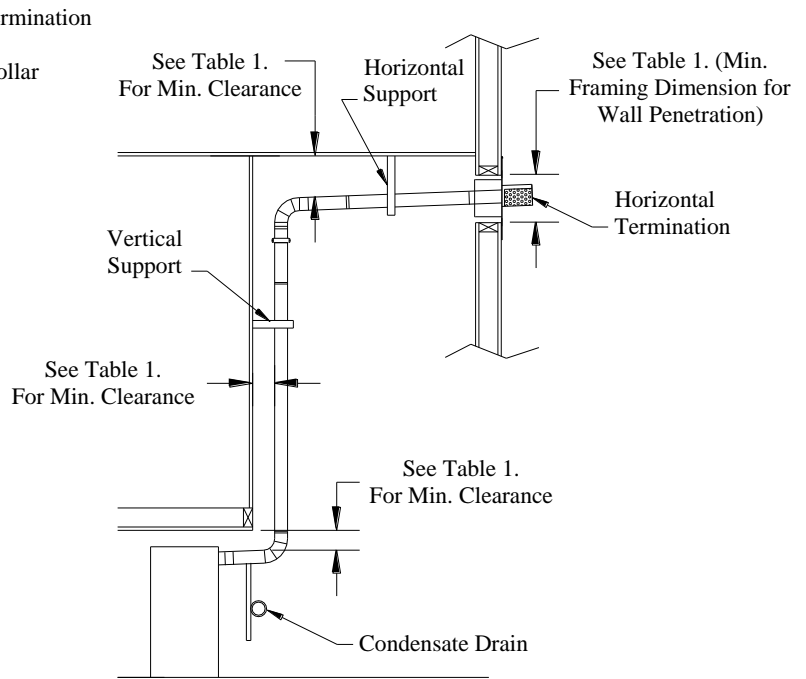


Fig 2. (Horizontal Termination)

In addition to the configurations shown in Figs. 1 & 2, this system may be installed in any combination of vertical and horizontal, unenclosed configurations as long as the minimum clearances are maintained per clearance Table 1 and the total length and number of fittings does not exceed the appliance manufacturers recommendations. This system may also be installed within an existing masonry chimney.

Notes:

1. Unenclosed systems require at least one side open (combustible material on maximum of 3 sides).
2. Reduced clearances may be attained by using noncombustible enclosures.
3. Systems fully enclosed by combustible material are not permitted.
4. Do not place insulation in any required clearance spaces surrounding the vent system unless these instructions suggest otherwise and the insulation is specified or supplied.
5. Noncombustible enclosures require 0" air space.

VENT ROUTING LIMITATIONS - MAXIMUM EQUIVALENT LENGTHS

In order to insure the vent system is not overly restrictive to flow, refer to the maximum length of vent specified by the appliance manufacturer. In order to account for turns in the system (which cause additional resistance to flow) most manufacturers recommend using an "Equivalent Length" method of determining the limitations. Via such method, elbows and tees are assigned an "equivalent length" (in feet). If the sum of straight length segments and additional "equivalent lengths" (due to turns) exceeds the limit specified by the manufacturer, the routing is not permitted. See appliance manufacturer's instructions for additional information.

If the appliance manufacturer's instructions do not list equivalent lengths for standard fittings, use Table 2 to determine the Equivalent Length of the vent fittings.

Equivalent Length Table	
Fitting	Equivalent Length
Straight Length	1' per 1'
Boot Tee	10'
90 Degree Elbow	10'
70 Degree Elbow	8'
45 Degree Elbow	5'
30 Degree Elbow	4'
15 Degree Elbow	3'

Table 2

GENERAL INSTALLATION REQUIREMENTS

1. In instances where the appliance manufacturer's instructions conflict with requirements in this document, the appliance manufacturer's instructions take precedence.
2. Failure to conform to any of these requirements may violate local, state or national codes as well as create conditions which may cause catastrophic property damage and/or personal injury.
3. The horizontal vent connector must slope continuously toward an appliance drain, a drain fitting or tee, or the termination. The vent must be pitched at least 1/4 inch per foot so that any condensate is not retained in any part of the venting system.
4. If called for by the appliance manufacturer's instructions, a drain fitting must be located as close as possible to the appliance flue outlet. Additional drains are required for each 30' of vent. If a drain fitting is not supplied with the appliance, install a Saf-T Vent in-line drain or a tee with a drain tee cover. Properly dispose of collected condensate.
5. Multiple Category III or IV appliances may not be interconnected to any part of the venting system unless the appliance manufacturer has specifically approved the engineering of the vent system. A Category III or IV appliance may not be interconnected to any part of a vent system used with a natural draft or draft hood appliance, except when a listed mechanical draft system is installed.
6. For venting systems that extend through any zone above that on which the connected appliance is located (except for one and two family dwellings), codes require that the vent system be enclosed with an enclosure having a fire resistance rating equal to or greater than that of the floor or roof assemblies through which it passes. In one and two family residential construction the system must be enclosed whenever passing through occupied spaces. The enclosure should be fabricated to allow periodic inspection of the vent.
7. Whenever gas-burning equipment is installed in the same space where halogenated substances may exist (refrigerants, solvents, bleaches, salts, etc.), clean outside air must be utilized for combustion.
8. When passing 5' or more of vent through an unheated area (such as attics, crawl spaces, building exteriors or above roof lines), it is recommended that the system be converted to double wall CI Plus to prevent condensation and freezing.
9. The vent system shall not be routed into, through or within any other actively used vent or chimney.
10. Another appliance may not vent into the flue space outside the Saf-T Vent conduit. However, if there is sufficient space and all manufacturer's instructions and codes are followed, a separate chimney liner may be installed within the chimney to vent another appliance.

HORIZONTAL INSTALLATION REQUIREMENTS

1. If the termination is through a combustible wall, the system must include Wall Penetration and a Saf-T Vent termination as required by the appliance manufacturer.
2. The horizontal termination shall be located not less than 12 inches above grade or anticipated snow line (remember to consider snow and ice falling from overhead objects), and not less than 7 feet above grade when located adjacent to a public walkway. It shall also terminate a minimum of 4 feet below, 4 feet horizontally from, or 1 foot above any door, window, fresh air intake, utility meter or regulator unless the appliance is Listed differently. The termination must be a minimum of 6 feet from the combustion air intake of any other appliance. Proper judgment may require greater distances depending on the size of the equipment installed or site conditions. Consult with the local Authority Having Jurisdiction.
3. The termination should be away from trees, shrubs, or decorative items as flue gases could cause damage.
4. The total equivalent horizontal distance of the vent system from the appliance flue collar to the termination shall not be less than 14 inches.
5. A minimum of one (1) horizontal support is required for every 6 feet of run.

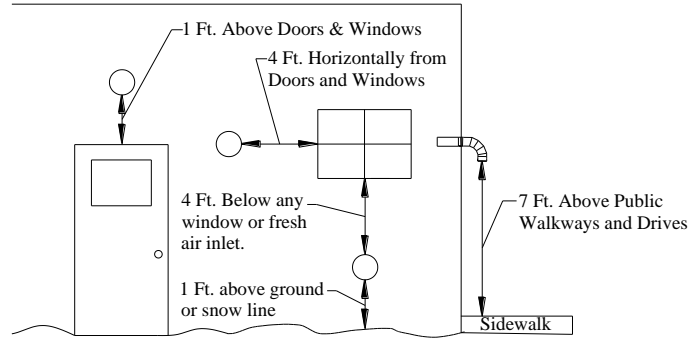


Fig 3. (Horizontal Installation Requirements)

VERTICAL INSTALLATION REQUIREMENTS

1. The vent system must terminate at least 3 feet above the roof line and at least 2 feet higher than any portion of the building within 10 feet.
2. When terminated at a height of more than 6 feet above the roof, the vent must be supported by a Saf-T Vent Guy Section. Refer to the Guy Support section of these installation instructions.
3. The vent system must terminate with one of the Saf-T Vent Terminations; except when a Termination or approved mechanical vent device is specified or provided by the appliance manufacture.
4. The total continuous distance of the vent system from the appliance flue collar to the termination shall not exceed that specified in the appliance manufacturer’s installation instructions. When venting natural draft appliances the termination must be at least 5 feet above the topmost draft hood. Otherwise a Listed mechanical draft inducing device is required.
5. Vertical supports are required after every transition to vertical and as specified in Table 2. Vertical supports are also required above every offset elbow. See Table 2 for vertical support limits.

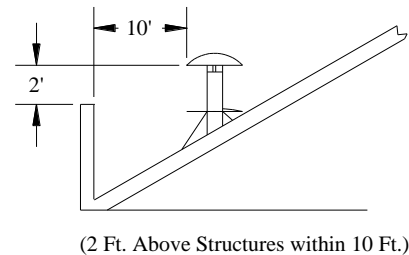


Fig 4. (Vertical Installation Requirements)

JOINT SEALING AND CONNECTION METHOD

Model EZ Seal (Diameters 6" thru 16") is joined using the Ring & Tab Method. EZ Seal is also manufactured with a factory installed seal on the inside of the female (outlet) end making the use of any additional sealant unnecessary.

To Connect:

Note: When provided, apply Heat-Fab 7001SIL-5 lubricant to the seal to improve ease of installation before connecting parts.

1. Connect parts using the Ring and Tab Connection Method. See Fig 5A.
 - a. To connect, slide the lock ring away from the end to allow clearance for the tabs extending from the female end.
 - b. Engage the two sections making sure the tabs

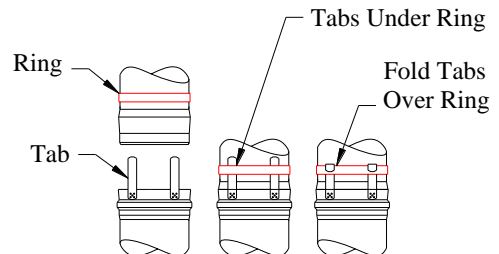


Fig 5A. (Ring and Tab Joint)

- stay to the outside of the vent.
- c. After the sections are fully engaged, slide the lock ring down over the tabs, making sure all tabs are contained within the lock ring.
 - d. Bend the tabs back over the lock ring to complete the joint. Note: Some termination parts have a hose clamp in place of the lock ring. In such cases, the hose clamp is tightened down over the tabs. The tabs need not be bent over the clamp.

Model GC (Diameters 18" thru 32") is joined using the Locking Strap method. Model GC requires RTV sealant to be applied at each joint during the assembly process.

To Connect:

1. Remove the Locking Strap from the Vent (See Fig.5B)
2. Wipe/clean the outlet and the inlet ends of the GC pipe with alcohol wipes.
3. At $\frac{3}{4}$ " inside the outlet end, apply a $\frac{1}{4}$ " thick, continuous, straight-line bead of high temperature sealant to the inside circumference. Do not use a zig-zag pattern when applying sealant.
4. Smooth down the bead with a flat instrument or moistened finger (See Fig. 5B).
5. Insert the male (outlet) end into the female (inlet) end, and align the Locking Tabs on the two parts.
6. Wrap the Locking Strap around the joint so that the tabs extruding from the vent align and engage into the slots in the Locking Strap. NOTE: The Tabs on the male end of elbows and tees are permitted to rotate so that the vent can be aligned to the desired direction.
7. Install Bolt and Nut through the end tabs of the Locking Strap and tighten strap using a 7/16" nut driver or socket. CAUTION: DO NOT over tighten the clap as it may cause the vent to collapse (See Fig 5B).

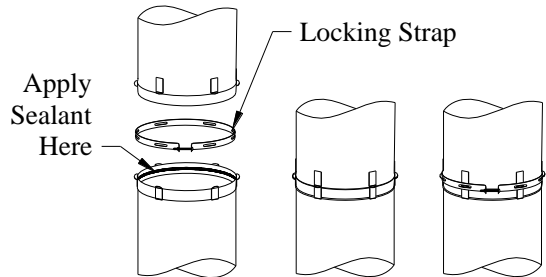


Fig 5B. (Locking Strap Joint)

Condensate Drains:

When An Internal Condensate Drain Is NOT Part of the Appliance:

- A Saf-T Vent In-Line Drain Section, Tee or Boot Tee with a separate Tee Cover Drain is strongly recommended. Install this drain fitting as close to the appliance flue collar as possible (See Fig. 6A).
- Use the Boot Tee to transition from horizontal to vertical and attach the Drain Tee Cover to the appropriate leg of the tee (See Fig 6A).
- A condensate drain is required for every 30 feet of horizontal vent and at/near the bottom of a vertical stack.
- Use the In-Line Drain Section for a straight horizontal run. Rotate the fitting so that the drain tube points downward and is as vertical as possible (See Fig. 6B).
- A Condensate Drain Tube Kit is available to drain the condensate to an appropriate location (i.e. floor drain or vented sanitary sewer connection). A trap loop must be formed into the drain hose and must be a diameter that is at least four times the appliance's rated stack pressure in inches of water column or 3 inches, whichever is greater. Secure the loop with a cable tie. Prior to final assembly the trap loop must be 'primed' by pouring a small quantity of water into the drain hose.
- Follow all local and national codes and regulations for the draining of acidic condensate.
- In cold climates do not install a condensate drain on the exterior of the building. Doing so may result in dangerous icy conditions on surfaces near the drain and may cause damage to the vent system and/ or the building exterior. Selkirk Corp. will **NOT** be held liable for any injury or property damage due to formation of ice.

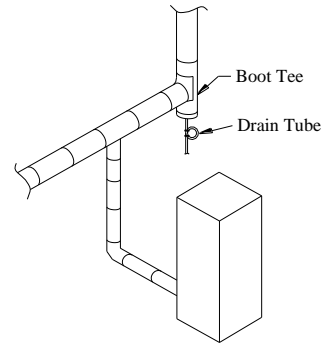


Fig 6A. (Boot Tee w/ Drain Cover & Tube)

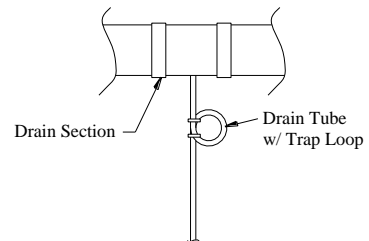


Fig 6B. (In-Line Drain Section and Drain Tube)

Adjustable Length

The Adjustable Length Section serves as a variable length between other components when specific lengths cannot be utilized and eliminates the need to cut parts to length. For proper installation, refer to instructions packaged with the Adjustable Length (See Fig. 7).



Fig 7. (Adjustable Length)

Customized Lengths— Cutting Standard Lengths

The Saf-T Vent EZ Seal system (6"-16") is designed so that in most cases standard lengths will not need to be cut. There may arise, however, an occasional situation where standard lengths and adjustable length slip connectors are not adequate. In such cases, a standard length of Saf-T Vent may be field cut.

To custom cut a standard length part:

1. Measure the length of vent needed (Dim A) and add 3 inches to the result (See Fig. 8).
2. Measuring from the female end (end with the tabs) measure out the distance $A + 3"$ and mark it on the pipe.
3. Cut the pipe with an abrasive cutoff, plasma, or compound snips.

To help get a square cut, create a straightedge by wrapping masking tape around the waste side of the cut point. If using snips, start the cut at the male end and follow a spiral path around the pipe until the cutoff mark is reached.

4. File off any burrs that develop in the cutting process prior to assembling. If the cutting process distorts the roundness of the pipe carefully use your thumbs to re-round the end.
5. Apply high-temperature silicone sealant to the field-cut joint.
6. Assemble the joint using the procedures above.
7. A hose clamp must be used to retain the tabs.

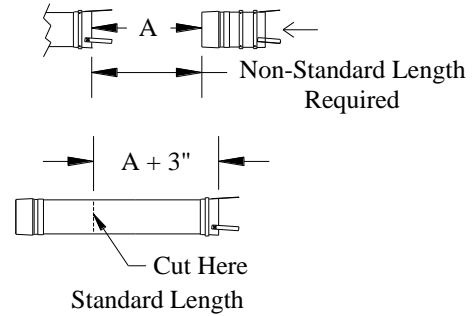


Fig 8. (Cutting Standard Lengths)

Spacing Between Supports		
Diameters	Vertical Spacing	Horizontal Spacing
6" to 12"	20'	Every six (6) feet and after every transition from vertical to horizontal.
14" to 18"	12'	
20" to 24"	10'	
26" to 32"	6'	

Table 3. (Vertical and Horizontal Support Requirements)

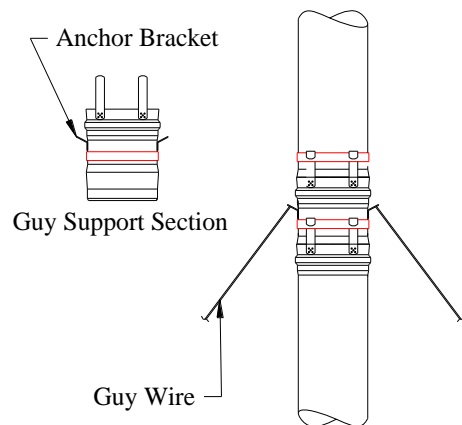
Vertical and Horizontal Support

For proper installation, Vertical and/or Horizontal supports must be installed to support the Saf-T Vent. Refer to **Table 3** for minimum spacing distances and the corresponding section for instructions for installing the support. Note: For all support options, ensure all minimum clearance to combustibles are maintained. Never drill or screw through the Saf-T Vent system.

Guy Support Section

The Guy Support is a short section of vent pipe with brackets protruding from it. These brackets provide a means for attaching a guy line, threaded rod or similar metal bracing to provide support to the vent system.

To Install: Connect Guy Section to the vent using standard joint connection method. Attach guy wires or metal bracing to the brackets provided on the Guy Section. Anchor guy wires or bracing to the building infrastructure capable of supporting the load of the vent (See Fig. 9).



**Fig 9. (Guy Support Assembly)
(Model EZ Seal Shown)**

Support Clamps

Support Clamps may be suspended from rods or cables and used as a saddle to rest the vent in or they may be used in pairs to clamp around the vent and suspended from a single rod, or cable (See Fig. 10).

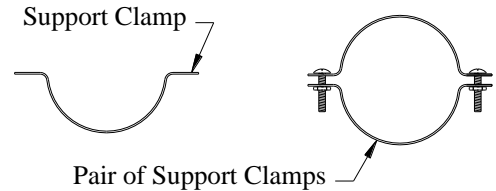


Fig 10. (Support Clamps)

EZ Seal Horizontal Clearance Support Clamp

The Horizontal Clearance Support Clamp (Sizes 3"-10") provides horizontal support for the vent and establishes a specified amount of clearance to combustible materials. To install: Secure the mounting plate to the wall by installing fasteners through the pilot holes in the mounting plate, and into the wall. Install a pair of Support Clamps around the vent, and secure the Support Clamp to the Horizontal support by installing a bolt through the mounting tabs on the Support Clamps and through the pilot hole in the 2" Horizontal Support (See Fig. 11).

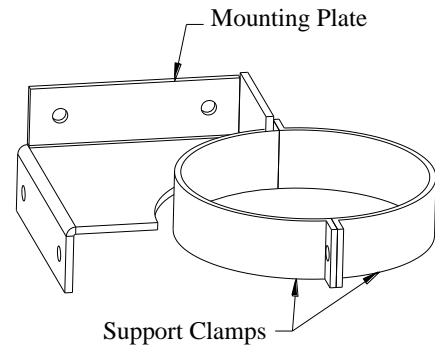


Fig 11. (2" Horizontal Clearance Support)

EZ Seal Vertical Clearance Support Clamp

The Vertical Clearance Support Clamp (Sizes 5"-10") provides vertical support for the vent and establishes a specified amount of clearance to combustible materials. To install: Secure the mounting plate to the wall by installing fasteners through the pilot holes in the mounting plate, and into the wall. Route the vent through the Support Clamp and secure by tightening the Worm Gear (See Fig. 12).

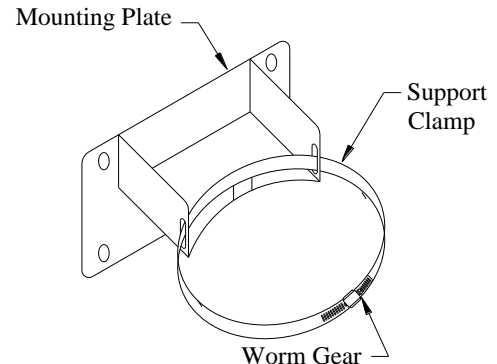


Fig 12. (2" Vertical Clearance Support)

Wall Penetration Assembly

A Wall Penetration Assembly is required when passing through a combustible wall.

To Install:

1. Prepare an opening in the wall where the Penetration will be installed. Refer to Table 1 for proper framing dimensions. The opening may be round or square as long as the minimum framing dimension is established. Additional framing may need to be added to the wall section to provide adequate support for the Wall Penetration Assembly.
2. From the outside, position the Wall Penetration into the hole (See Fig. 13).
3. Use fasteners to secure the Wall Penetration to the wall.
4. Proceed with installing the Saf-T Vent sections routing the vent through the Wall Penetration. The Vent must protrude at least 2 inches beyond the Wall Penetration and must have the required $\frac{1}{4}$ inch per foot pitch towards the appliance.
5. Install the End Collar on the section of vent that passes through the Penetration and position the End Collar so that it is in contact with the outlet end of the Wall Penetration and closes off the gap between the Wall Penetration and the Vent.
6. Secure End Collar by tightening the worm gear.
7. Using Silicone Sealant, seal any gaps between the wall, the Wall Penetration, the End Collar and Saf-T Vent.

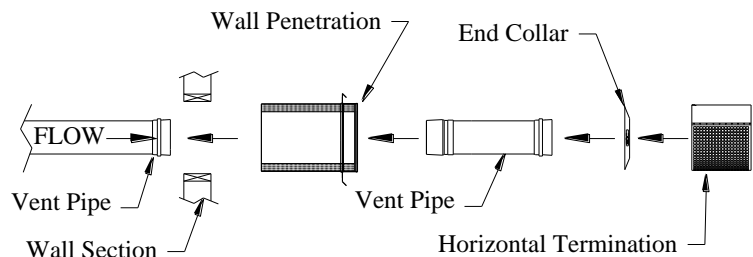


Fig 13. (Wall Penetration)

Wall Penetration & Horizontal Termination

The Wall Penetration & Horizontal Termination is the standard Wall Penetration Assembly that includes a Horizontal Termination. To install:

1. Follow Steps 1-7 in the Wall Penetration Assembly Section.
2. Align the Termination with the Wall Penetration so that the solid portion of the screen is rotated to the top.
3. Secure the Termination to the Penetration with screws.
4. The Termination may be easily removed for inspection of the venting system (See Fig 14).

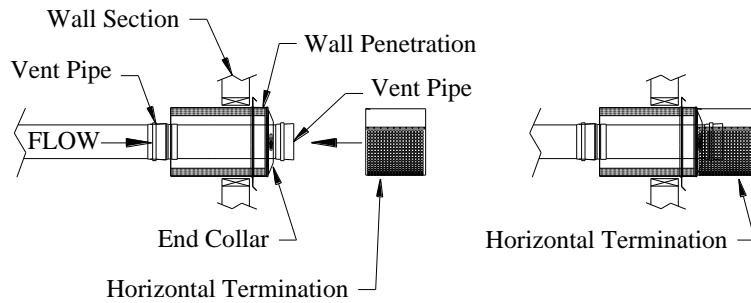


Fig 14. (Wall Penetration & Horizontal Termination)

Screen Terminations

Screen Terminations are used to terminate a horizontal vent system. There are several different Screen Termination styles available. These include the Mitered Termination Screen, an Elbow Termination with Screen and a Standard Screen Termination. All Screen Terminations are install the by using either the standard Ring & Tab Connection method or the Locking Strap Joint Connection method. All Screen Terminations must terminate a minimum of 6" from the wall (See Fig. 15).

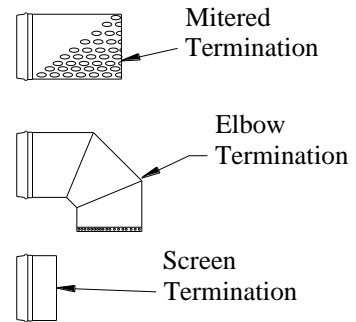


Fig 15. (Horizontal Screen Terminations)

Roof Jack

The Roof Jack provides for vertical penetrations through non-combustible ceiling or roof structures and also provides support for the vent system. For installation instructions refer to instructions packaged with the Roof Jack.

Joist Shield

The Joist Shield provides for vertical penetrations through non-combustible ceiling or roof structures.

To Install:

1. Prepare an opening in the ceiling where the Joist Shield will be installed. Refer to Table 1 for proper framing dimensions. The opening may be round or square as long as the minimum framing dimension is established.
2. From the top side of the ceiling or roof, install the Joist Shield so that the shield extends down into the framed opening created in step 1 (See Fig. 16).
3. Use fasteners to secure the Joist Shield to the roof or top of joist.
4. Proceed with installing the Saf-T Vent sections routing the vent through the Joist Shield.

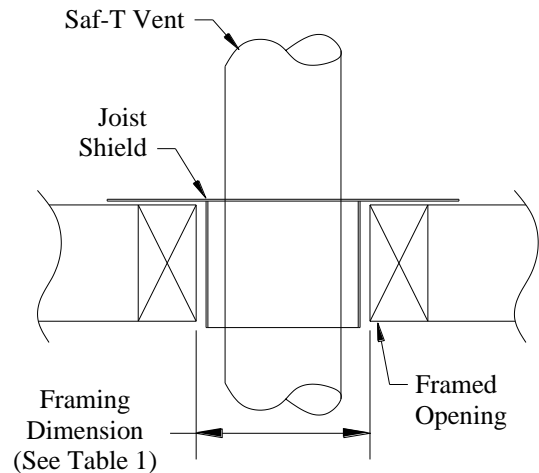


Fig 16. (Joist Shield)

Tall Cone Flashing

The Tall Cone Flashing is for vertical terminations through a flat roof. Note: For combustible roofs a Joist Shield must be installed prior to installing the Flashing (See Fig. 17A).

To Install directly on Flat Roof:

1. Prepare a round or square opening in the roof. See Table 1 for Clearance & Framing dimensions.
2. Apply weather-stripping or outdoor caulk to the bottom of the cone plate.
3. Attach the cone to the roof using common construction methods.
4. Flash over the cone plate and seal the fastener heads using normal roofing requirements.
5. Install Vent pipe through the Tall Cone. Refer to corresponding section for instructions on installing the Storm Collar and Rain Cap (See Fig. 17A).

To Install on Roof Curb:

1. Prepare roof curb using standard construction methods. See Table 1 for Clearance & Framing dimensions.
2. Place the Cone on top of the curb and mark the outline of the curb on the bottom of the cone plate.
3. Use snips to notch out the corners of the plate to match the outline of the curb.
4. Apply weather-stripping or outdoor caulk to the bottom of the cone plate.
5. Install Cone on top of curb and bend down the extra material with duckbill pliers to create a cap which fits over the curb.
6. Attach the cone to the roof using common construction methods.
7. Install Vent pipe through the Tall Cone. Refer to corresponding section for instructions on installing the Storm Collar and Rain Cap (See Fig. 17B).

Pitched Roof Flashing

The Pitched Roof Flashing is for vertical terminations through a non-combustible pitched roof. Note: For combustible roofs model CI-Plus flashing and Vent pipe should be used, refer to CI-Plus installation instructions for details.

To Install:

1. Prepare a round or square opening in the roof. See Table 1 for Clearance & Framing dimensions.
2. Apply weather-stripping or outdoor caulk to the bottom of the cone plate.
3. Attach the cone to the roof using common construction methods.
4. Flash over the cone plate and seal the fastener heads using normal roofing requirements.
5. Install Vent pipe through the Tall Cone. Refer to corresponding section for instructions on installing the Storm Collar and Rain Cap (See Fig. 18).

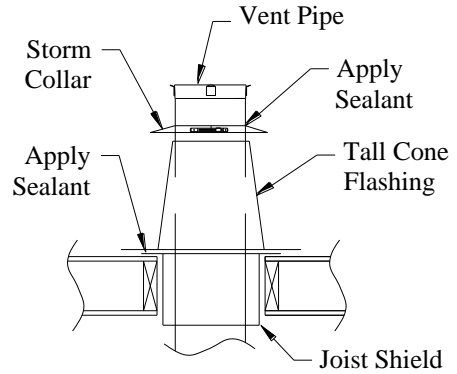


Fig 17A. (Tall Cone Flashing Directly on Flat Roof)

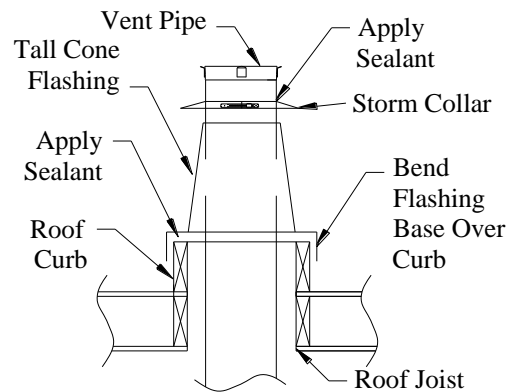


Fig 17B. (Tall Cone Flashing on Roof Curb)

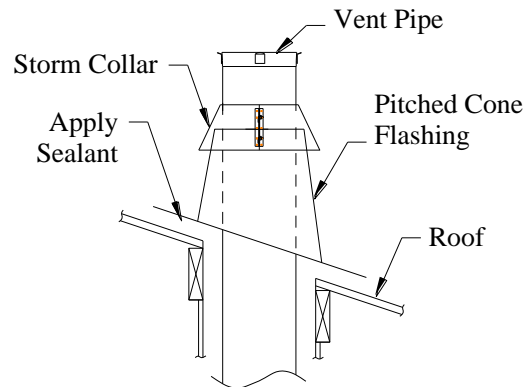


Fig 18. (Pitched Cone Flashing)

Storm Collar

The Storm Collar is designed to shed rain away from the flashing opening.

To install:

1. Place the Storm Collar over the last segment of vent and slide it down to where it is 2" above the outlet of the flashing. This 2" air space will release any buildup of heat from inside the cone.
2. Depending on the type of storm collar you have, tighten the worm gear or the bolts on the tab to secure the Storm Collar to the vent. Apply silicone sealant over the joint between the vent pipe and the Storm Collar (see Figs. 17A, 17B & 18).

Rain Cap

The Rain Cap terminates the vertical vent system and prevents rain from entering the vent. The Rain Cap includes a Storm Collar that is used to attach the rain cap to the vent system.

To Install:

1. Refer to Vertical Termination Requirements section for guidelines for locating the Rain Cap.
2. Depending on the type of Storm Collar you have, loosen either the worm gear or the bolts on the Storm Collar and slide the collar down over the pipe (See Fig. 19).
3. Install the Rain Cap onto the last vent pipe segment. Note: To allow removal of the Rain Cap for inspection Do NOT Seal joint with RTV sealant.
4. Raise the Storm Collar up so that it is directly on the Locking Strap or Ring and Tab Joint and tighten Worm Gear or Bolts to secure Rain Cap to the Vent.

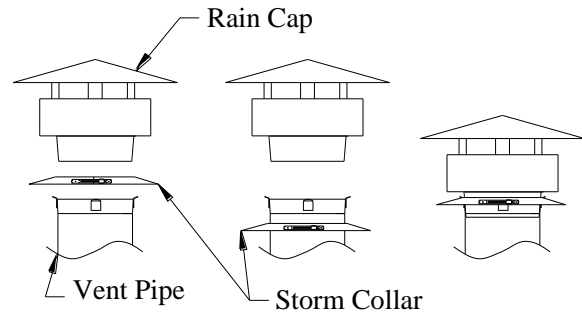


Fig 19. (Rain Cap)

Appliance Connectors

Connect the Saf-T Vent system to the appliance flue collar as directed in the appliance manufacturer's instructions. If the appliance flue collar is not designed for direct connection to the Saf-T Vent system, a special appliance adapter may be required. See Heat-Fab appliance adapter chart, the appliance manufacturer's instructions or contact Heat-fab for recommended adapters.

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Tips for a Successful Installation

Heat-fab's Saf-T Vent systems (single-wall Saf-T Vent and double-wall Saf-T CI Vent) are Special Gas Vent systems designed to meet the unique venting challenges presented by positive-pressure, condensing gas-fired appliances.

Saf-T Vent systems have been successfully installed in thousands of residential, commercial and industrial settings with a track record of superior performance dating back nearly 10 years.

As part of our effort to continuously improve the products we manufacture, Heat-fab has performed extensive testing, visited job site installations and listened to countless installers. The information we have gathered has prompted us to write this bulletin which highlights important installation practices that lead to gas-tight, leak-proof, properly installed systems.

Key Points

1. Read & Follow the Appliance Manufacturer's Instructions.
2. Read & Follow Heat-fab's Instructions.
3. Use RTV Sealant – Proper RTV is a must.
4. Ring-and-Tabs Make the Joint – UL-tested closure system that is time-proven.
5. Get Going in the Right Direction – Follow the flow arrows.
6. Maintain Proper Slope – Install with a continuous ¼" per foot (minimum) slope back to the appliance.
7. Drain the Condensate – Don't forget the trap if you need one.
8. Provide Adequate Support – Support after every offset or elbow, after every 6 feet of horizontal run, and at each adjustable fitting.
9. Inspect Annually.

1. Read & Follow the Appliance Manufacturer's Instructions.

- Manufacturers develop and test their appliances to operate efficiently and safely when vented properly. Many appliance installation manuals will give instructions on the maximum number of offsets or elbows as well as the total equivalent length of vent allowed. Always refer to the manufacturer's manuals for guidance.
- Common venting of appliances is permitted only when allowed by the appliance manufacturer(s).
- Some appliances must be vented with double-wall Saf-T CI Vent. If the manual does not distinguish between single- and double-wall, call Heat-fab for a recommendation.
- Manufacturer's instructions supercede Heat-fab's manuals.
- Clearance requirements outlined in the appliance manufacturer's manuals must be followed. Their clearances and/or national and local code requirements take priority over Heat-fab instructions.

2. Read & Follow Heat-fab's Instructions.

- Every part in a Saf-T CI Vent double-wall system is packaged with a copy of Heat-fab's "Installation and Maintenance Instructions".
- Critical components (elbows, tees, and terminations) in a Saf-T Vent system are packaged with "Installation and Maintenance Instructions" and other supplemental instruction sheets.
- Accessories (roof jacks, vertical supports, and wall penetrations) come with detailed instructions specific to their proper installation.
- If you have questions on correct installation methods, call us. Our engineering technicians would love to hear from you.
- Installation information is also available at our web site www.heat-fab.com.
- **BEFORE YOU TRY IT YOUR WAY, PLEASE TRY OUR WAY FIRST!**

3. Use RTV Sealant.

- Sealant **MUST** be used!
- GE RTV 106 or Dow Corning 732.
- GE RTV 106 will cover all Heat-fab installations with flue gas temperatures up to 550°F.
- Dow Corning 732 may be used on low temperature applications with flue gas temperatures up to 300°F.
- Clean the joint area before applying sealant. Alcohol pads are included with each part and should be used to remove dirt and trace oils.
- A 1/8" bead of sealant is enough.
- Apply the sealant where it belongs – on the outside of the male end (without tabs), about 1/4" – 3/8" up from the end of the part.
- A straight-line bead works just fine – a zigzag or wavy line usually applies too much sealant and could leave gaps.
- Inspect the joint after it has been put in place. Apply extra sealant to any voids or crevices. Smooth it out with your finger if you want – but wipe the excess on a paper towel or work rag, not on your clothes. RTV will stain and is difficult to remove.
- Be sure to apply extra sealant when called for. Some joints, such as adjustable sections and flue collar connections, require additional sealant.
- **GIVE IT A REST!** Dow Corning and GE both recommend sealant be allowed to cure for 24 hours before operating the appliance.

4. Ring-and-Tabs Make the Joint.

- After applying the RTV sealant insert the tapered male end into the flared female fitting, using enough pressure to completely seat the connection.

DO NOT attempt to make up inches by joining the sections partially.

- Slide the Ring over all Tabs, bringing it down as far as possible. Now bend the Tabs over completely. A flat head screwdriver can be helpful to start bending the Tabs. Some installers use a wooden mallet, small hammer, or the handle of a screwdriver to tap down the bent Tabs. This helps to firmly seat the joint and makes a tight connection.

Be careful – you do not want to dent or damage the Venting System.

- Inspect the joint after it has been put in place. Apply extra sealant to any voids or crevices. Smooth it out with your finger if you want – but wipe the excess on a paper towel or work rag, not on your clothes. RTV will stain and is difficult to remove.
- DO NOT use screws or pop rivets when joining these systems!

5. Get Going in the Right Direction.

- Every length of Heat-fab vent has a product sticker with an arrow showing the direction of flue gas flow.
- The tapered ends of the Saf-T Vent systems are designed to help drain condensate back to the appliance. Although the direction of the tapered ends will seem backward for smooth airflow, don't worry. It's more important to remove the condensate from the system.
- All you really need to remember is "Point the Tabs toward the Termination".
- Line-up the seams – makes a good-looking job!
- Turn the seams up towards the ceiling when installing horizontally.

6. Maintain Proper Slope.

- Install with a continuous ¼" per foot (minimum) slope, as is required by the National Fuel Gas Code for all gas-fired appliances.
- Vent systems for condensing appliances must have a continuous ¼" per foot (minimum) slope toward the appliance or a condensate drain. Always check the Appliance Manufacturer's instructions for proper drain requirements!
- Some appliances require the venting system to be sloped toward the **horizontal termination**.
- Remember, if you raise the appliance or lower the ceiling – you will have to adjust the slope of the vent to maintain the ¼" per foot minimum.
- Use the chart below to help plan your system.

Horizontal Length	Flue Pitch
1 foot	¼ inch
2 feet	½ inch
3 feet	¾ inch
4 feet	1 inch
5 feet	1 ¼ inches
6 feet*	1 ½ inches
7 feet	1 ¾ inches
8 feet	2 inches
9 feet	2 ¼ inches
10 feet	2 ½ inches

Horizontal Length	Flue Pitch
11 feet	2 ¾ inches
12 feet*	3 inches
13 feet	3 ¼ inches
14 feet	3 ½ inches
15 feet	3 ¾ inches
16 feet	4 inches
17 feet	4 ¼ inches
18 feet*	4 ½ inches
19 feet	4 ¾ inches
20 feet	5 inches

Horizontal Length	Flue Pitch
21 feet	5 ¼ inches
22 feet	5 ½ inches
23 feet	5 ¾ inches
24 feet*	6 inches
25 feet	6 ¼ inches
26 feet	6 ½ inches
27 feet	6 ¾ inches
28 feet	7 inches
29 feet	7 ¼ inches
30 feet*†	7 ½ inches

* A Horizontal Support is required every six feet and after every elbow or offset.

† A Condensate Drain is required every 30 feet.

7. Drain the Condensate.

- Never install a drain in a vent system for an appliance that has not been investigated for use with a condensate drain.
- Follow the Appliance Manufacturer's installation instructions. Some require condensate drains only for vent systems over a certain length.
- If a drain is required Heat-fab recommends:
 - Drains at all transitions from horizontal to vertical vent runs.
 - Immediately before a horizontal termination.
 - After every 30 feet of continuous vent.
 - The first drain should be as close to the appliance flue collar as possible. Some appliances have internal drains or drains built into their vent adapter.
 - Avoid drains outdoors in cold climates. When transitioning from horizontal to vertical up the outside of a building, use an elbow instead of a boot tee. Locate a drain fitting inside the building as close to the elbow as possible.
- Always connect the drain to a sanitary sewer or other approved disposal.
- Trap the drain if needed.
- Use the Drain Hose Kit – it connects easily and can also be used as a drain trap when looped. It is available in 5- and 10-foot lengths.

8. Provide Adequate Support.

- On horizontal runs support the vent system every 6 feet and after each elbow or offset. Adjustable sections should be supported as well.
- On vertical installations support is required at minimum after every 30 feet of vertical rise, at each floor penetration, and at the roof penetration. For large diameter systems (12 inch and larger), most installers find it easier to use more support brackets to support the system during installation.
- Support should be provided at the first section above a boot tee that is installed at the base of a vertical stack.
- To support long vertical runs inside a chase or chimney, use either guy wire supports or vertical supports. Guy wire supports work best for tight or inaccessible stacks, but require a set of guy wires for each support. Vertical supports are mounted directly to the inside wall of the chase or chimney.
- Heat-fab guy wire supports are necessary when the vent system extends above the roofline six feet or more.
- Use Heat-fab support brackets or strapping. Our support clamps can be used with threaded rod either singly (as a saddle) or in pairs.
- When using clamping-style supports, do not over-tighten to the point that the vent is damaged or deformed.
- Some installers prefer to hang perforated channel iron to form a trapeze and rest the vent on top of it.
- Consider the behavior of the appliance when planning your supports. Some appliances create pulsing vibrations in their vent systems. Avoid attaching the supports to structural components that may transmit vibrations to occupied spaces. Be sure the support fasteners (nuts, bolts, etc.) cannot vibrate loose.

9. Inspect Annually.

- During your annual HVAC equipment and system check, inspect the vent system. Make sure the system has not been damaged, the vent has not been punctured and the supports are solid.
- Look for the proper slope toward a drain. Make sure drains are not clogged or pinched off, and are in the proper place. Verify that any drain traps are properly primed.
- Inspect the termination and remove any accumulated debris.
- Properly installed and maintained, Heat-fab Vent Systems will be trouble free for years.

Your Check List

- You have read the Appliance Manufacturer's installation instructions.
- You have read Heat-fab's installation manual.
- You properly applied the correct RTV sealant.
- All vent system joints are tight and secure.
- The vent system is installed with flow arrows pointing away from the appliance.
- Proper slope has been maintained.
- You have made provisions for the system to drain – when necessary.
- The vent system is supported adequately.
- You have explained the vent system to the building maintenance personnel.

This document is designed as a summary of issues to be aware of when using Heat-fab's Saf-T Vent and Saf-T CI Vent systems. It is not intended to take the place of the complete installation manuals that should be reviewed and followed closely.

Further information, including complete installation manuals, is available by calling 800.772.0739. Or log onto our Internet site at: www.heat-fab.com.