



# ICC - Model VIP+

## Positive Pressure Chimney System and Grease Duct

### INSTALLATION AND MAINTENANCE INSTRUCTIONS

## Scope and Recommendations

The ICC Model VIP+ is a double wall construction listed venting system designed for venting boilers, engines and other commercial and industrial heating appliances. Positive pressure piping system up to 60" w.c. (15 Pa.).

**Listed Models :** VIP+ Double Wall Air Insulated Chimney (1" Air Space)  
VIP+ Double Wall 1" Fiber Insulation  
VIP+ Double Wall 2" Fiber Insulation  
VIP+ Double Wall 4" Fiber Insulation

**Sizes:** Ø6" (152mm) to Ø24" (610mm) Flue Diameters

#### WARNING

- A major cause of vent related fires is failure to maintain required clearances (air space) to combustible materials. It is of utmost importance that this venting system be installed only in accordance with these instructions. Do not fill the air space with insulating material.
- Contact local building or fire officials about restrictions and installation inspection in your area.

Do not begin installing the ICC Model VIP+ venting system until you have carefully read the appliance and vent system installation instructions.

Use only ICC Model VIP+ components. Failure to do so will void the certification and warranty of the product.

Keep these installation and operating instructions in a safe location for future reference.

- Examine all components for possible shipping damage prior to installation.
- Proper joint assembly is essential for a safe installation.
- Follow these instructions exactly as written.
- Check tightness of joints upon completion of assembly.
- This venting system must be free to expand and contract.
- This venting system must be supported in accordance with these instructions.
- Check for unrestricted vent movement through walls, ceilings, and roof penetrations.
- Different Manufacturers Have Different Joint Systems and Adhesives.
- Do Not Mix Pipe, Fittings, or Joining Methods from Different Manufacturers.

Tested and Listed to:

UL-103 , UL-2561 , ORD ULC C-959 , UL-1978 , ULC-S662  
by Underwriters Laboratories, Inc (Listing # MH16722)



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# Technical Specifications

## Material

The Model VIP+ double wall vent is constructed of either stainless steel grade 304 or 316 for the flue and stainless steel grade 304 or 316 or Galvalume for the casing. When required, the vent is insulated with high temperature mineral fiber insulation. Proper joint sealant or gasket material is provided as per venting application (Low Temp or High Temp).

## Weight / Standard Thickness

Table 1 - Standard Thickness and Chimney Weight											
Ø		6	8	10	12	14	16	18	20	22	24
VIP+ 1" Air Insulated	Flue Thickness	0.019"						0.025"			
	Casing Thickness	0.019"						0.025"			
	Weight (lbs / ft)	3.3	4.2	5.1	6.0	6.9	7.9	9.9	11.0	12.0	13.1
VIP+ 1" Fiber	Flue Thickness	0.019"						0.025"			
	Casing Thickness	0.019"						0.025"			
	Weight (lbs / ft)	4.4	5.6	6.9	8.1	9.3	10.6	13.0	14.4	15.7	17.1
VIP+ 2" Fiber	Flue Thickness	0.019"						0.025"			
	Casing Thickness	0.019"						0.025"			
	Weight (lbs / ft)	6.4	8.0	9.5	11.1	12.6	14.0	17.0	18.7	20.4	22.1
VIP+ 4" Fiber	Flue Thickness	0.019"						0.025"			
	Casing Thickness	0.019"						0.025"			
	Weight (lbs / ft)	11.3	13.5	15.7	18.0	20.2	22.4	26.0	28.3	30.2	33.5

On request, model VIP+ Venting System can be built using thicker gauge material. Contact Factory for weight specifications with non-standard thickness

## Venting Applications

### Building Heating Appliance (BHA) Chimney (UL 103 Listing) :

Under this category, model VIP+ has been determined suitable for venting flue gases at temperatures not exceeding 538°C (1000°F) under continuous operating conditions from gas, liquid, oil or solid fuel fired appliances. Also complies with operation (less than one hour) at temperatures not exceeding 760°C (1400°F) and brief operation (maximum 10 minutes) at temperatures not exceeding 927°C (1700°F).

Building Heating Appliance Chimneys are suitable for use with Building Heating Appliances and Low Heat Appliances as described in the Chimney Selection Chart of National Fire Protection Association (NFPA) Standard NO. 211.

### 1400°F Chimney (UL 2561 Listing) :

Under this category, model VIP+ has been determined suitable for venting flue gases at temperatures not exceeding 760°C (1400°F) under continuous operating conditions from gas, liquid, oil or solid fuel fired appliances. Also complies with brief operation (maximum 10 minutes) at temperatures not exceeding 980°C (1800°F). As such, it is suitable for use with ovens and furnaces as described in the Chimney Selection Chart of NFPA No. 211, in addition to other applications.

### Positive Pressure Listing (UL 103 and UL 2561) :

Model VIP+ has been determined suitable for use at a maximum of 60 inch water column internal pressure.

### 540°C and 760°C Industrial Chimneys (ULC C-959 Listing) :

Under this category, model VIP+ has been determined suitable for venting flue gases at temperatures not exceeding 760°C (1400°F) under continuous operating conditions from gas, liquid or oil fired appliances. Also complies with brief operation (maximum 10 minutes) at temperatures not exceeding 980°C (1800°F).

## Surroundings / Enclosure

ICC Model VIP+ chimney is primarily intended to be used in fire resistive non-combustible surroundings or installed unenclosed. They are not intended for use in one or two family residences.

## CAUTION

Do not enclose this chimney in a chase or passageway of ordinary wood or other combustible material

Where the chimney extends through any zone of a building (outside that in which the heating appliance connected to it is located), it shall be provided with an enclosure having a fire resistance rating equal to or greater than that of the floor, wall or roof assemblies through which it passes.

ICC Model VIP+ chimney may penetrate a combustible floor or roof using the appropriate parts and openings sizes. See section **Roof and Floor Penetrations** for more details.

Where, according to local code, no chase enclosure is necessary, Model VIP+ chimney may be placed adjacent to walls of combustible construction at the clearance specified on each chimney section and in the individual listing. (see **Table 2 Clearances to Combustibles**) Contact local building or fire officials about restrictions and installation inspection requirements in your area.

### Clearance to Combustibles

Table 2 - Clearances to Combustibles – Unenclosed Installation					
Venting Application	Maximum Flue Temperature	Flue Ø	VIP+ Chimney Model		Roof Kit Configuration
			VIP+ air insulated	VIP 1" , 2" and 4" fiber insulated	
Building Heating Appliance (BHA) Chimney	1000°F (538°C)	Ø6" to 16"	6"	2"	*Insulated Firestop
		Ø18" to 24"	10"	3"	
1400F Chimney	1400°F (538°C)	Ø6" to 24"	6"	7"	*Ventilated Firestop

\*See **Roof and Floor Penetrations** section for details

### Part Numbers

The following section describes how part number are defined for most of the major VIP+ products. Please refer to other ICC documents like pamphlets or price lists for a complete list standard of components part numbers. Contact ICC customer's service for details.

Table 3A - Part Numbers Examples									
Product Type	1st diam Ø <sub>A</sub>	Part Designation	Material				Insulation Type	2nd diam Ø <sub>B</sub>	Description
			Interior		Exterior				
			type	gauge	type	gauge			
JC -	18	L4	A	24	A	24	0	n/a	18" diameter x 4 foot Length, Air Insulated, 304 stainless flue and casing
JE -	8	E1	A	26	A	26	1	n/a	Ø8" 15° Elbow, 1" Fiber Insulated, 304 stainless flue and casing
JE -	16	TR	B	26	C	24	4	n/a	Ø16" 90° Tee, 4" Fiber Insulated, 316 stainless flue and Galvalume casing
JM -	6	SI	B	26	B	26	2	10	Ø6" to Ø10" step increaser, 2" Fiber Insulated, 316 stainless flue and casing
JM -	24	WS	A	24	A	24	1	n/a	Ø24" Wall Support, 1" Fiber Insulated, 304 stainless flue and casing
...									...

The first section of the part number regroups similar products under a common product type designation. Products are divided into the following 5 categories :

Table 3B - Product Types	
Product Types Designation	Product Type Description
JC	Chimney Length
JE	Elbows and Tees
JF	Flashings
JM	Miscellaneous
JS	Special Parts

This section identifies the type of part within each of the 5 products type. Here's

Table 3C - Part Type Designation Examples		
Product Type	Part Type Designation	Corresponding Part Description
JC -	L1	1 foot Length
JC -	L2	2 foot Length

a sample of some of the more common part types :

JC -	L3	3 foot Length
JC -	L4	4 foot Length
JC -	A1	Adjustable Length 12"
JC -	A2	Adjustable Length 24"
JC -	IT	Tapered Increaser
JC -	SI	Step Increaser
JC -	LE	Expansion Length
JE -	E1	15° Elbow
JE -	E3	30° Elbow
JE -	E4	45° Elbow
JE -	E9	90° Elbow
JE -	TR	90° Tee
JE -	TY	45° Tee
JF -	FF	Flat Flashing
JF -	FA	Flashing 1/12 – 7/12
JF -	FB	Flashing 8/12 – 12/12
JM -	WS	Wall Support
JM -	BS	Base Support
JM -	WB	Wall Band (or Wall Guide)
JM -	FG	Floor Guide
JM -	RC	Rain Cap
JM -	RS	Insulated Radiation Shield
JM -	VS	Ventilated Radiation Shield
JM -	EC	Exit Cone
JM -	FS	Firestop
JM -	TC	Tee Cap
JM -	TD	Drain Tee Cap
...	...	...

**Table 3D - Material Designation**

Material Designation	Material type	Comments
A	Stainless Steel 304	Available for flue and casing, 26 ga min (up to Ø16) and 24 ga min (Ø18 and over)
B	Stainless Steel 316	Available for flue and casing, 26 ga min (up to Ø16) and 24 ga min (Ø18 and over)
C	Galvalume (Alu-Zinc)	Available for casing only, 26 ga min (up to Ø16) and 24 ga min (Ø18 and over)

\* Standard materials only, for other options contact ICC customer's service

**Table 3E - Insulation Type Designation**

Insulation Type Designation	Description
0	Double Wall Air Insulated Chimney (1" Air Space)
1	Double Wall 1" Fiber Insulation
2	Double Wall 2" Fiber Insulation
4	Double Wall 4" Fiber Insulation

## Chimney Sizing

Complete chimney system sizing and capacity may be obtained from the "Chimney, Gas Vent, and Fireplace Systems" chapter of the ASHRAE Handbook. You may also contact ICC Chimneys customer's service for system sizing assistance. In spite of any sizing guidelines, when sizing exhaust systems, it is most important that the heating appliance, engine or turbine manufacturer's installation instructions be followed. Not following these instructions may result in inadequate chimney performance and/or a violation of the equipment manufacturer's installation requirements.

# Operation and Maintenance

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KEEP YOUR VENT CLEAN. Your vent system should be examined annually by a qualified service company for the presence of soot or debris. Any accumulation should be removed. Also, the vent system should be inspected periodically for the following:

1. Any leakage of condensate or combustion by-product at joints should be removed.
2. A defective drain trap loop should be repaired to prevent any leakage of exhaust gases inside the building area.
3. Any sign of corrosion.

## General Installation Notes

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1. Model VIP+ is to be installed in accordance with these installation instructions and with those of the appliance manufacturer.
2. Installation is to be in accordance with local building code requirements and National Codes.
3. Size the vent in accordance with the appliance manufacturer's instructions. ICC will calculate correct vent sizing on request.
4. Make sure you read the appliance installation instructions for vent limitations such as maximum horizontal length, maximum number of elbows, total vent height, common venting option, and other limitations that may affect the design and installation of this vent.
5. The maximum height of un-guyed vent above the roof is 6 feet.
6. The vent shall extend at least 3ft. above its point of penetration with the roof and at least 2 ft. higher than any wall, roof or adjacent building within 10 ft of it.
7. **DO NOT FILL THE AIR SPACE** around the vent with insulation or any other material.
8. **Do not allow sawdust or construction debris** to accumulate around the vent. Clean all areas surrounding the vent before closing up any enclosed areas.

## Planning your Installation

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Prior to starting your installation, we suggest you take the following into consideration:

1. Check the appliance manufacturer's installation instructions to see all possible vent configurations.
2. Review all your options for the appliance location and also venting configuration. Try to minimize the alteration and reframing of structural components of the building (wall studs, water pipes, electrical wiring, ceiling joists, roof rafters, etc.). It may be easier to change the location of your appliance than to modify the building structure.
3. **Use only Model VIP+ listed components.** Do not use damaged parts.
4. Any penetrations of roof, ceilings, or floors must be properly fire-stopped as per venting applications described in these installation instructions.
5. Contact your local building authority and/or fire officials for permits, restrictions and installation inspections. You may also wish to contact your building insurance representative.

### *Tool checklist*

Tools and equipment you may need for your installation.

- |                  |                |                              |                |
|------------------|----------------|------------------------------|----------------|
| - Eye protection | - Stud sensor  | - Keyhole saw                | - Hammer       |
| - Gloves         | - Square       | - Ladder                     | - Screwdrivers |
| - Tape Measure   | - Circular saw | - Level                      | - Screws       |
| - Extension cord | - Hand saw     | - Pliers                     | - Plumb Bob    |
| - Marking pencil | - Drill        | - Caulking gun               | - Cold chisel  |
| - Nails          | - Drill bits   | - Proper application sealant |                |

### *Rules of Safety*

1. Wear gloves when handling metal parts with sharp edges.
2. Wear safety glasses.
3. Electrical tools must be grounded.
4. If a ladder, scaffold or a scissor lift platform is required, it must be in good condition, installed on a firm surface, and leveled.
5. When cutting a wall, floor or ceiling, be careful not to damage wiring, gas or water pipes. If these elements need to be relocated, work should be done by a qualified person.

# Chimney Joint Connection

## Surface Preparation

All components have a male and a female end. The installation orientation is indicated on the labeling of each pipe section with an arrow. The arrow indicates the direction of the exhaust gases. Clean all inner and outer surfaces of male and female ends with an appropriate organic solvent, such as acetone or other commercial degreaser before applying a sealant.

## Sealant Application Chart

Table 4 - Sealant Used as Per Venting Application (Must use approved factory supplied sealant)					
600°F Max Applications			1000°F Max Applications		
<i>Indoors</i>	Supplier	Max Temperature	<i>Indoors</i>	Supplier	Max Temperature
Inner Joints	X-TRASIL HD #4706-3	600°F (315°C)	Inner Joints	Fortafix Ceramix TC	2280°F (1250°C)
Outer Joints	n/a	n/a	Outer Joints	n/a	n/a
<i>Outdoors</i>	Supplier	Max Temperature	<i>Outdoors</i>	Supplier	Max Temperature
Inner Joints	X-TRASIL HD #4706-3	600°F (315°C)	Inner Joints	Fortafix Ceramix TC	2280°F (1250°C)
Outer Joints	Any Silicone Sealant with a min. rating of 400°F	400°F	Outer Joints	Any Silicone Sealant with a min. rating of 400°F	400°F

Fortafix Ceramix TC cure time : Air dry for 24 hours and heated at 203°F (95°C) for 4 hours

X-Trasil HD #4706-3 cure time : Air dry for 24 hours

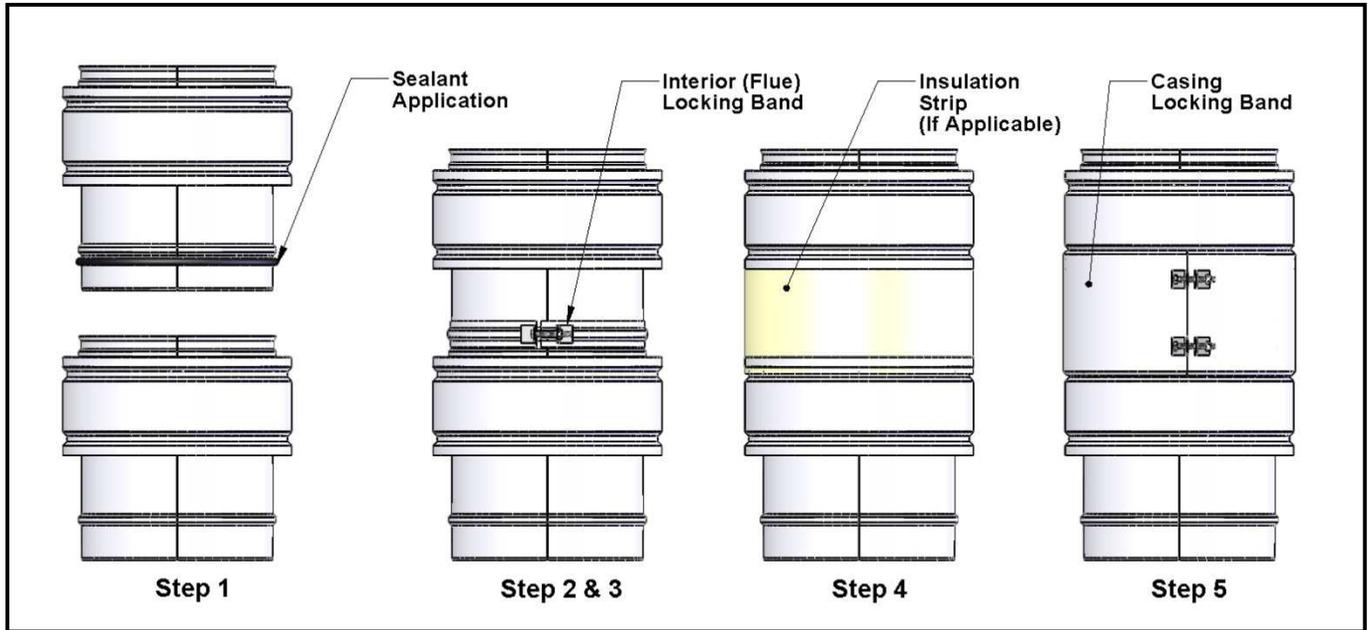
## Sealant Coverage

Table 5A – Sealant coverage for Fortafix Ceramix TC High Temperature Ceramic Paste Sealant										
Flue Ø (inches)	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Number of joints per tube	6.5	5	4	3.25	2.75	2.5	2.25	2	1.75	1.5
The coverage is about 21 linear feet per 11 oz cartridge - 2 beads per joint (Ø 1/4") flue sealant										

Table 5B – Sealant coverage for X-TRASIL HD #4706-3 High Temperature Silicone										
Flue Ø (inches)	6"	8"	10"	12"	14"	16"	18"	20"	22"	24"
Number of joints per tube	13	10	8	6.5	5.5	5	4.5	4	3.5	3
The coverage is about 42 linear feet per 11 oz cartridge - 1 bead per joint (Ø 1/4") flue sealant										

Table 5C – Sealant coverage for Exterior Sealant (based on casing diameter)													
Flue Ø (inches)	8"	10"	12"	14"	16"	18"	20"	22"	24"	26"	28"	30"	32"
Number of joints per tube	26	20	16	13	11	10	9	8	7	6	26	20	16
The coverage is about 66 linear feet per 11 oz cartridge - 1 bead per joint (Ø 1/8") flue sealant													

## Joint Assembly – Low temperature (600°F Max) Applications



**Figure 1**

**Step 1 :** Apply one bead of X-TRASIL HD #4706-3 red silicone on the male end of the flue just under the formed bead.

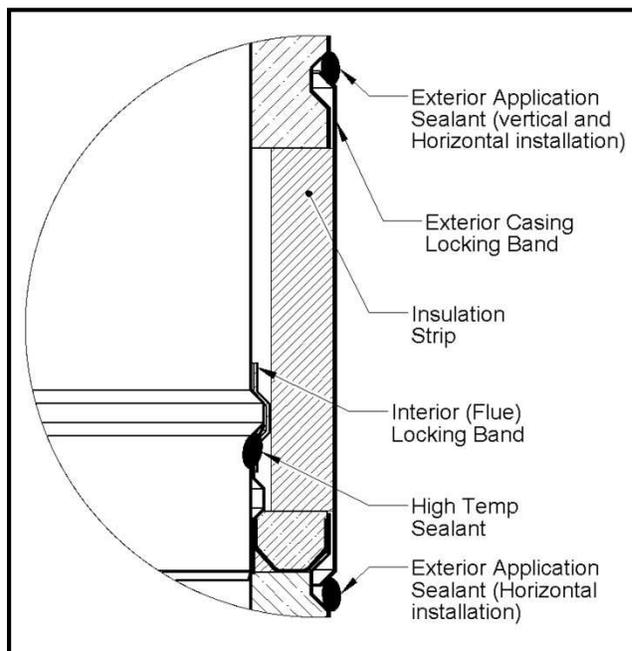
**Step 2 :** Slip the top chimney male end into the expanded side of the lower chimney. Refer to chimney label for flue gases direction.

**Step 3 :** Assemble the flue locking band and secure by tightening the bolt . Do not remove the excess of sealant.

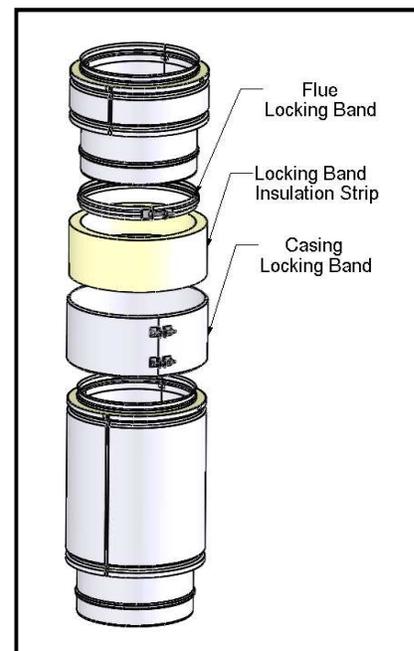
**Step 4 :** Install locking band insulation strip around the joint. (if applicable)

**Step 5 :** Install exterior casing locking band. Secure by tightening the 2 bolts.

**Step 6 :** Apply a bead of exterior sealant (see **Table 4** and **5C**) on the upper joint of the casing locking band (to prevent water infiltrations for outside applications only)

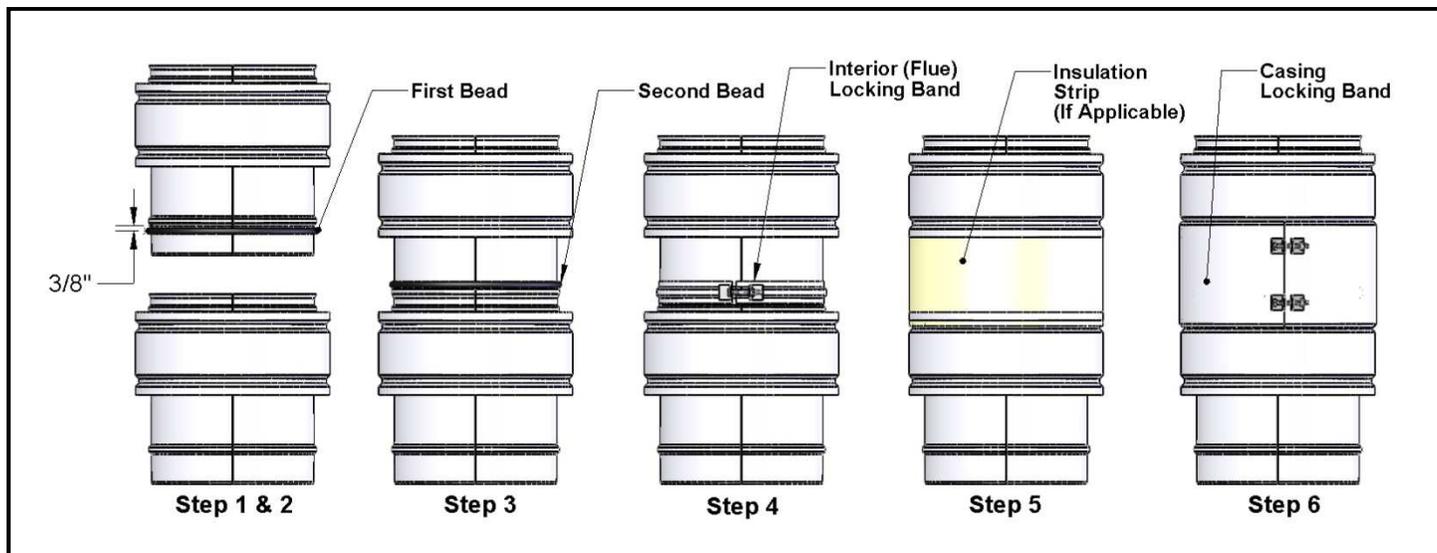


**Figure 2**



**Figure 3**

## Joint Assembly – High Temperature (Above 600°F) Applications



**Figure 4**

**Step 1 :** Apply one bead of Fortafix Ceramix TC on the male end of the flue approximately 3/8" under the formed bead.

**Step 2 :** Slip the top chimney male end into the expanded side of the lower chimney. Refer to chimney label for flue gases direction.

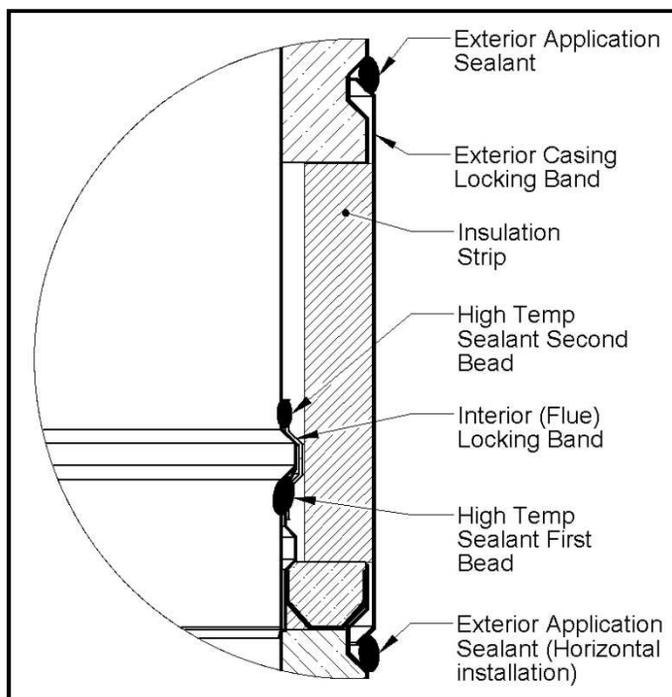
**Step 3 :** Apply a second Bead of Fortafix Ceramix TC just above the formed bead when chimneys are joined together (before interior locking band assembly)

**Step 4 :** Assemble the interior locking band around the flue and secure by tightening the bolt . Do not remove the excess of sealant.

**Step 5 :** Install locking band insulation strip around the joint. (if applicable)

**Step 6 :** Install exterior casing locking band. Secure by tightening the 2 bolts.

**Step 7 :** Apply a bead of exterior sealant (see **Table 4** and **5C**) on the upper joint of the casing locking band (for outside applications only)



**Figure 5**

# Structural Supports and Guides

Several supporting and guiding methods can be used to anchor a chimney for horizontal, vertical and offset displacement. These supports and guides used with thermal expansion devices prevent bending stresses on the chimney elbows and joints. (see *Thermal Expansion* Section for details) Supports and guiding methods are described in this Section.

## Base Support

The Base Support is the most common support. It can be used on any floor level as a Vertical or Horizontal support. When used to support the chimney in vertical runs, it is attached to the floor by means of anchors (by others,  $\varnothing 5/16"$  anchors or bolts min. size). It can also be used to support a horizontal run anchored through wall or resting on a non-combustible rigid structural brace (by others, see **Rigid Structural Braces Specifications** for details).

The Base Support assembly consists of a 9" chimney interior section (7" effective length) that is welded to a steel plate. The chimney section has female and male ends forming just like any standard length. It can be connected to any other piece of piping with proper locking bands and sealant. (see **Chimney Joint Connection** Section for specific instructions)

It is supplied with both an Interior Locking Band a special External Finishing Band (top female side) and an Insulation Strip. (if applicable)

### Installation :

1. Plate is secured to floor, wall or structure with proper anchors. (See **Table 6** for Maximum Supported Chimney Height (MCH) per support and **Table 7** for Maximum Horizontal Spacing between Supports (MHS)).
2. Pipe sections are then attached to the Base Support Interior Section in the same manner as described in **Chimney Joint Connection** Section depending on the venting application.
3. Install insulation strips (when required) and External Finishing Bands.

**The Base Support is intended only for attachment to NON COMBUSTIBLE materials such as steel structure, concrete or other types of masonry. The Base Support is not suitable for attachment to wood or combustible structures.**

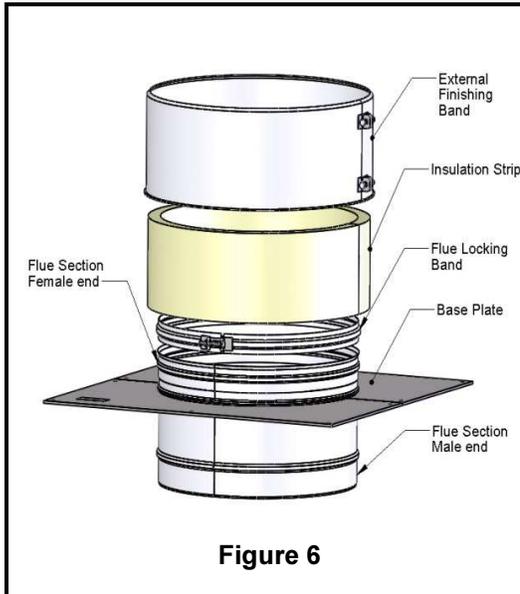


Figure 6

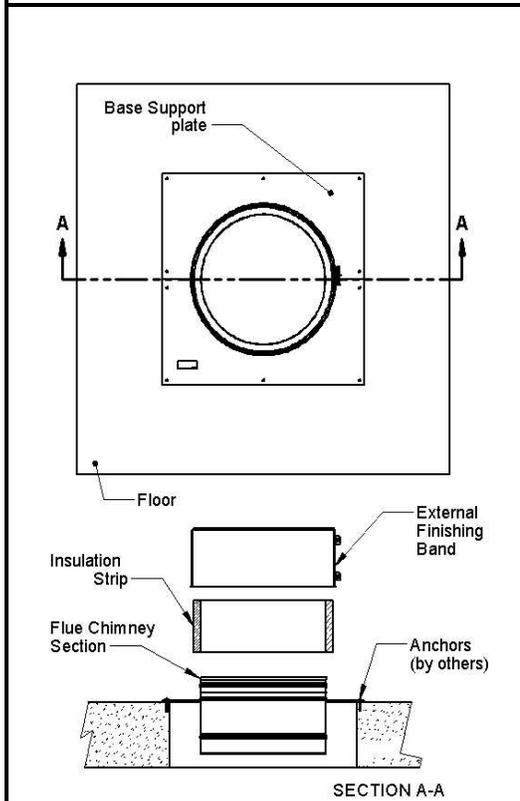


Figure 8

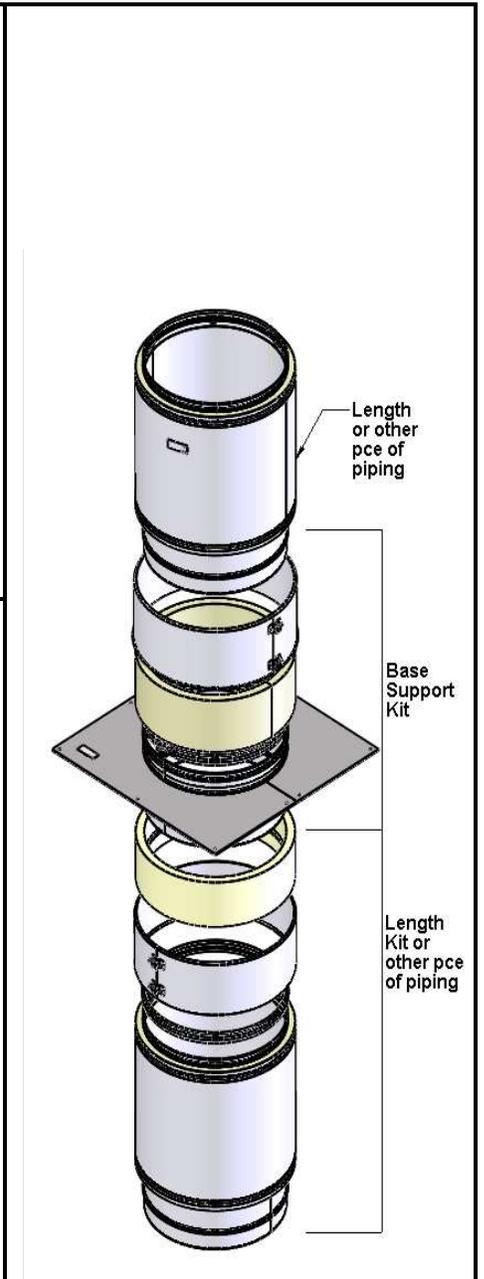


Figure 7

## Wall Support

The Wall Support can be used on any floor level as a Vertical or Horizontal support. When used to support the chimney in vertical runs, it is attached to the wall by means of anchors (by others,  $\varnothing$  5/16" anchors or bolts min. size). It can also be used to support a horizontal run anchored on a ceiling or a non-combustible rigid structural brace (by others, see **Rigid Structural Braces Specifications** for details).

The Wall Support assembly consists of a 9" chimney interior section (7" effective length) that is welded to a steel plate which is supported by angled brackets. The chimney section has female and male ends forming just like any standard length. It can be connected to any other piece of piping with proper locking bands and sealant. (see **Chimney Joint Connection Section** for specific instructions)

It is supplied with both an Interior Locking Band a special External Finishing Band (top female side) and an Insulation Strip. (if applicable)

### Installation :

1. The angled brackets are secured to wall, ceiling or structure with proper anchors. (See **Table 6** for Maximum Supported Chimney Height (MCH) per support and **Table 7** for Maximum Horizontal Spacing between Supports (MHS)).

2. Pipe sections are then attached and sealed to the Wall Support Interior Section in the same manner as described in **Chimney Joint Connection Section** depending on the venting application.

3. Install insulation strips (when required) and External Finishing Bands.

The Wall Support is intended only for attachment to **NON COMBUSTIBLE** materials such as steel structure, concrete or other types of masonry. The Wall Support is not suitable for attachment to wood or combustible structures.

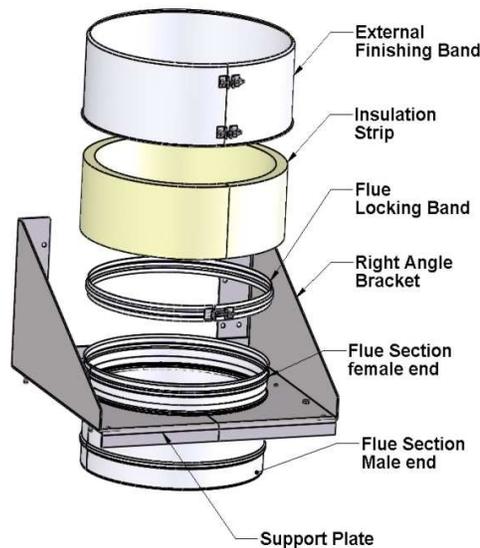


Figure 9

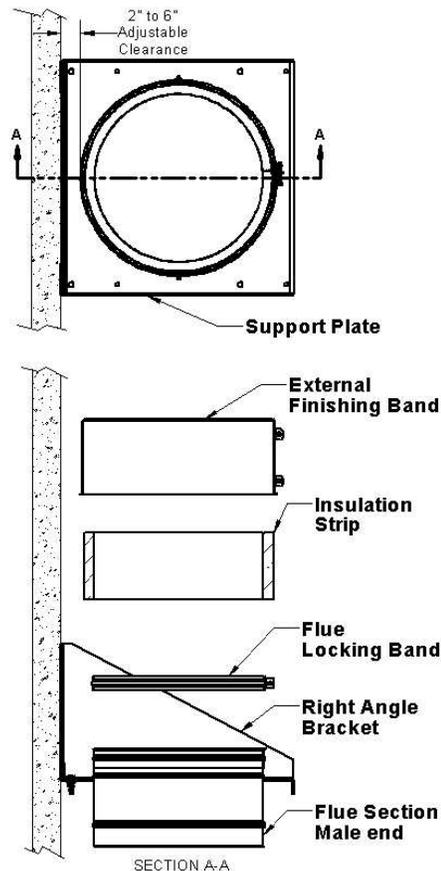


Figure 11

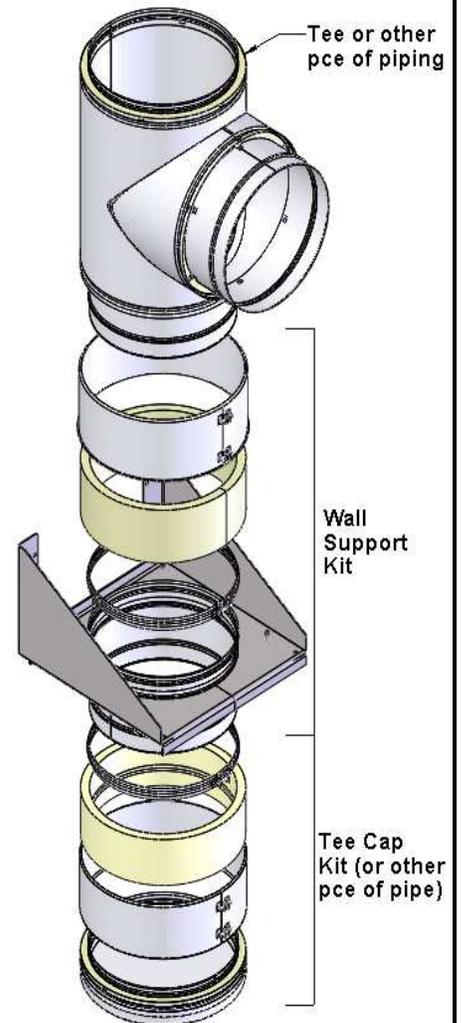


Figure 10

## Wall Guide

The Wall Guide is used as a lateral guide to resist lateral load. It does not carry any vertical chimney weight. It also maintains the minimum clearance to combustibles. (which can be adjusted from 2" to 6") It can also be used to stabilize the chimney horizontally.

The Wall Guide must be installed on the chimney's outer shell not on the outside finishing band. The locking band must be able to move without interfering with the guide when thermal expansion occurs.

The Wall Guide collar is secured on the outer casing of the chimney with the collar's 2 screws. The square angles must be anchored to the wall (combustible walls are allowed, at least 3x wood screws #10 x 2" per bracket) with a minimum of 3 anchors on each side. (by others)

See **Table 7** for Maximum Vertical Spacing between 2 Supports or Guides (MVS)

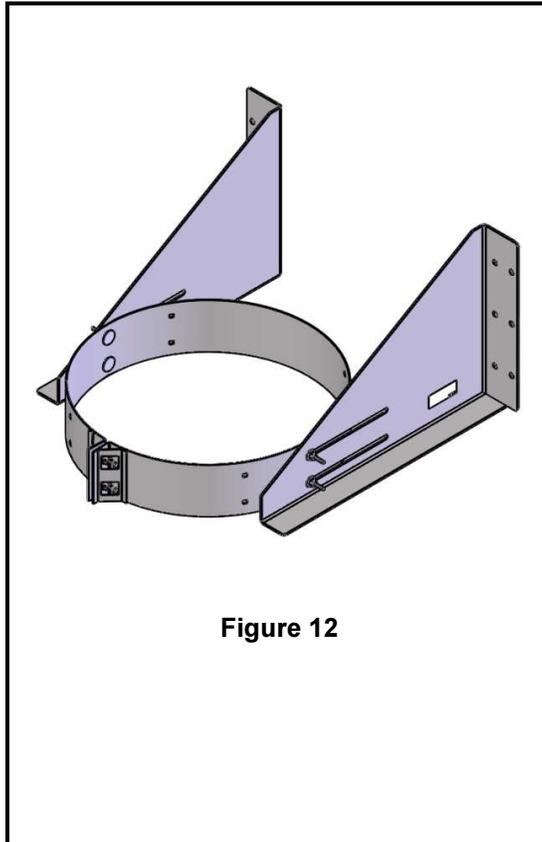


Figure 12

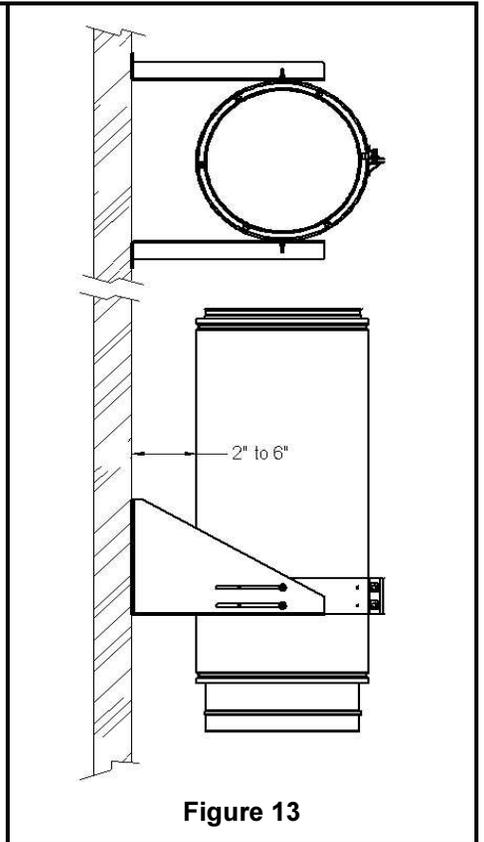


Figure 13

## Floor Guide

The Floor Guide is mainly used as a chimney stabilization device at floor penetrations. It does not carry any vertical chimney weight. It also maintains the minimum clearance to combustibles.

The Floor Guide must be installed on the chimney's outer shell not on the outside finishing band. The locking band must be able to move without interfering with the guide when thermal expansion occurs.

The Floor Guide collar is secured on the outer casing of the chimney with the collar's 2 screws. The 4 square brackets must be anchored to the floor (combustible floors are allowed, at least 4x wood screws #10 x 2" per bracket) with a minimum of 4 anchors per bracket. (by others)

See **Table 7** for Maximum Vertical Spacing between 2 Supports or Guides (MVS)

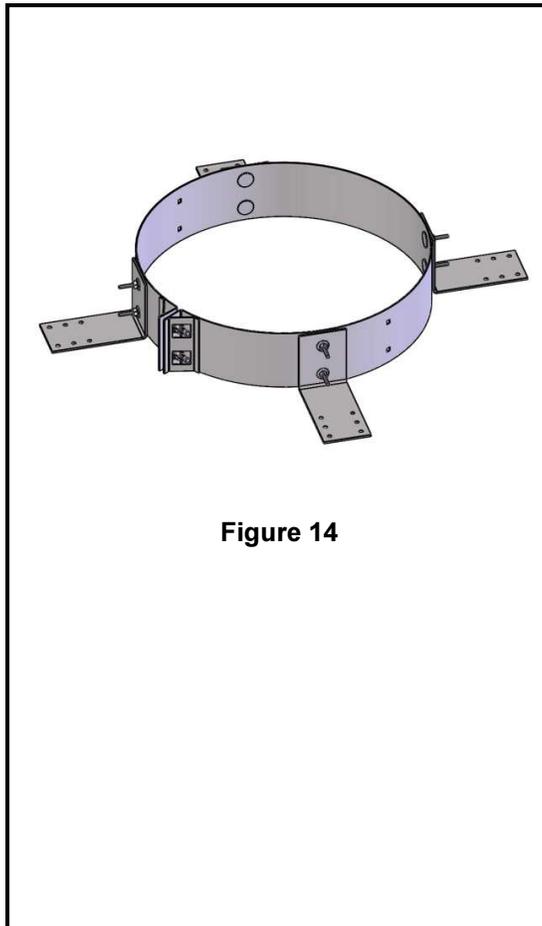


Figure 14

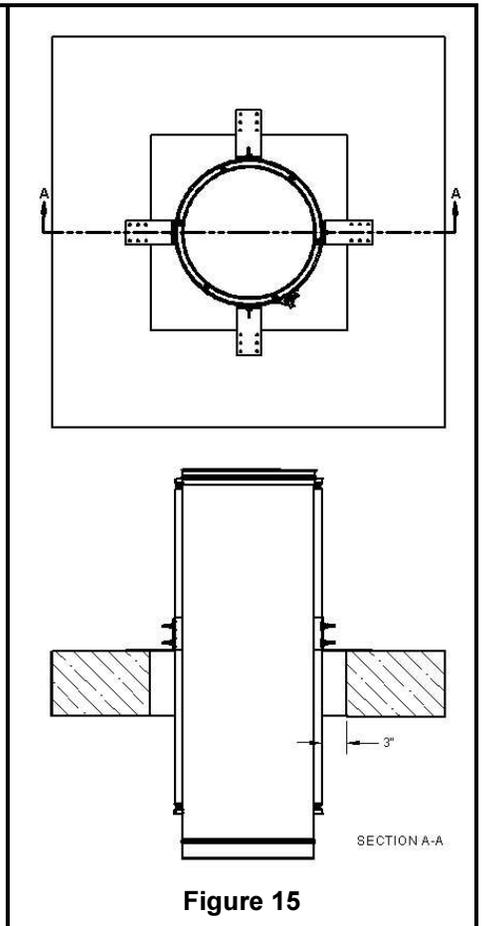


Figure 15

## Support Methods and System Design Limits

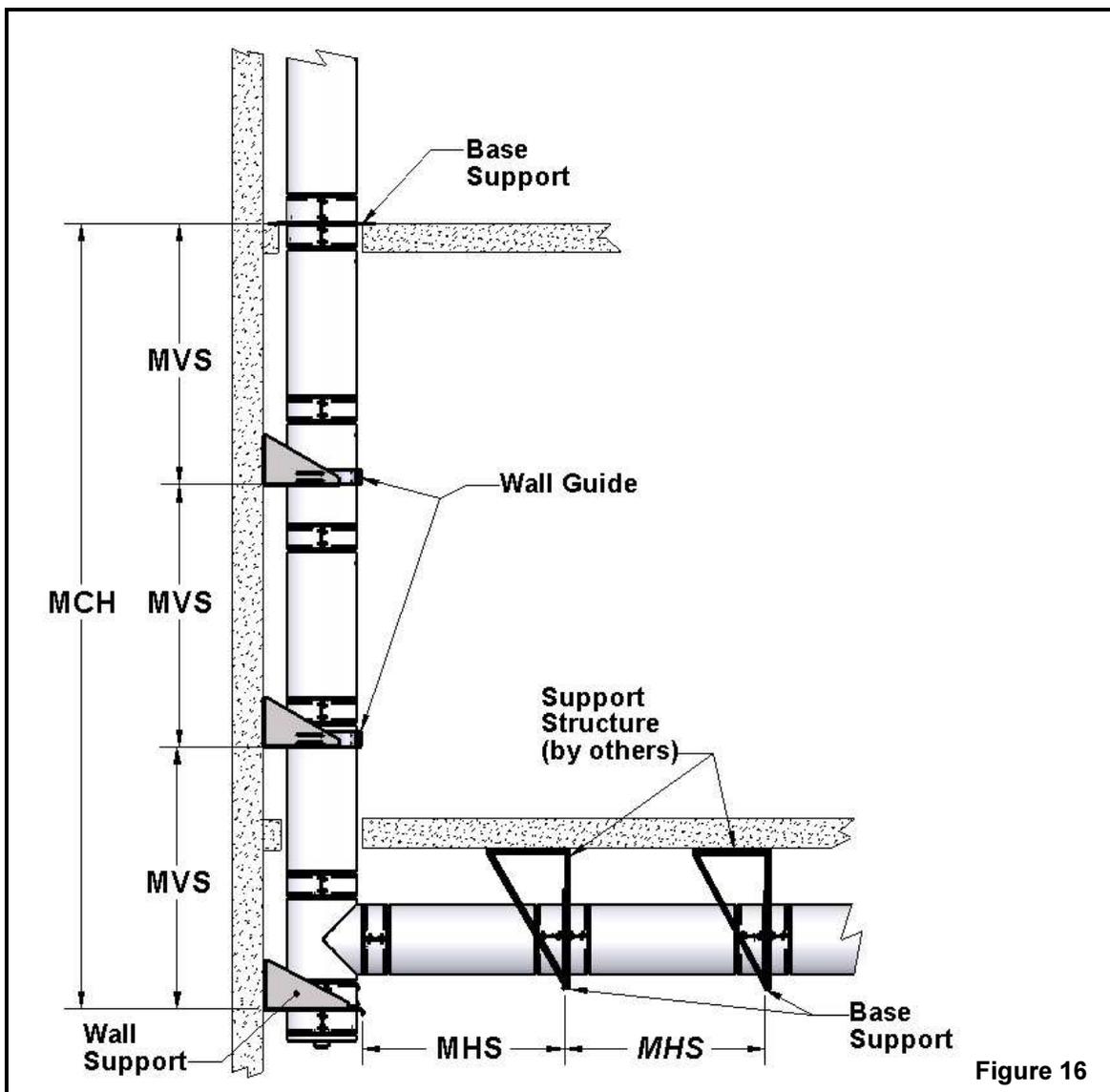
The supporting and guiding design parameters presented in this section must be closely followed to insure that your venting system is properly designed. Chimney must be supported (with base or wall support) at least every (MCH) feet and guided at least every (MVS) feet. A horizontal run must be supported (with a base or wall support) at least every (MHS) feet. See Figure 16 for typical System Design Limits application.

**Table 6 - Maximum Supported Chimney Height and Support Method (MCH)**

Support Method	Ø	VIP+ Chimney Model – MCH (feet)			
		VIP+ AIR Insulated	VIP+ 1" Fiber	VIP+ 2" Fiber	VIP+ 4" Fiber
Base Support	Ø 6" to 24"	51'	39'	30'	20'
Wall Support	Ø 6" to 24"	38'	29'	23'	15'

**Table 7 - Maximum Horizontal and Vertical Spacing (MHS and MVS)**

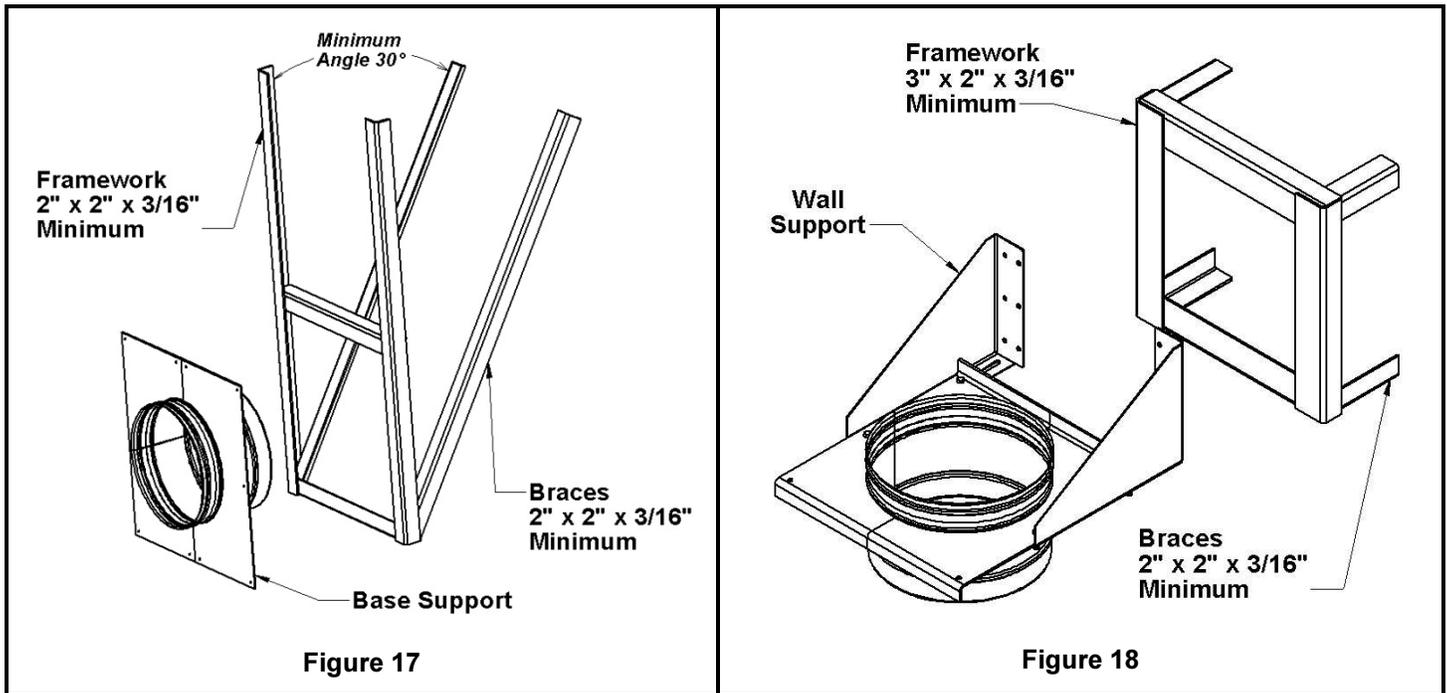
Ø	Dimensions	VIP+ Model – Dimension (feet)			
		VIP+ Air Insulated	VIP+ 1" Fiber	VIP+ 2" Fiber	VIP+ 4" Fiber
6" to 16"	MHS : Maximum Horizontal Spacing between Supports	16'	14'	12'	8'
	MVS : Maximum Vertical Spacing between 2 Supports or Guides	13'	13'	12'	10'
18" to 24"	MHS : Maximum Horizontal Spacing between Supports	12'	10'	8'	6'
	MVS : Maximum Vertical Spacing between 2 Supports or Guides	10'	10'	9'	8'



**Figure 16**

## Rigid Structural Brace Specifications

When necessary a Support Assembly must be secured to the building with a rigid structural framework. Satisfactory performance and service life of VIP+ Chimney Systems requires the product be rigidly braced and supported. Every installation presents unique support and bracing requirements and the following guidelines will provide minimum acceptable sizes for the mechanical hardware supplied by others.



## Elbows and Offsets

- Elbows are used for changes in direction in horizontal or vertical portions of a chimney system.
- Elbows are used in combination to make up different angles in horizontal and vertical breechings of the chimney.
- Special care should be exercised in designing the bracing for elbows because elbows can only take limited forces due to any bending moments
- Except where absolutely necessary, sloped or horizontal offsets in the vertical portion of a chimney above the breeching should be avoided.
- Sloped offsets require more expansion joints and secure bracing above and below elbows.
- Structural parts such as posts or beams may also be needed to hold chimney supports in position.
- There is no limit on the angle or slope of an offset for gas or liquid fuel burning appliances
- Chimneys for combination fuel heating appliances that are capable of burning solid fuel or are convertible to solid fuel are limited to 30° slope even if the current choice of fuel is gas or oil.
- The maximum length of offset, if one is necessary, is determined by strength considerations. The maximum dimension between supports (Base Supports or Wall Supports), given as the "MHS" dimension in the **Support Methods and System Design Limits (Table 7)** section of these instructions, is applicable to all horizontal and sloped orientations. (See **Figure 20**)
- To assure proper guidance of expansion joints and to prevent unnecessary joint bending, use an adequate number of supports at closer intervals.
- With generator set or turbine exhaust use Bellows Expansion Joint below each support in offset runs. For boiler exhaust use an Expansion Length.
- The ends of any sloped or horizontal offset must be anchored to prevent overstressing elbows and to assure proper operation of expansion joints.
- With frequent re-support, there is no structural or operational limit to the length of horizontal or sloped portions of a VIP+ Chimney, providing the system meets the capacity, pressure drop or available draft requirements of the appliance or equipment.
- The carrying capacity of the VIP+ supports and their structure attachments must consider the weight of the offset plus whatever vertical pipe is carried by that support. See **Table 6** for height limit of VIP+ supports (**MCH**).

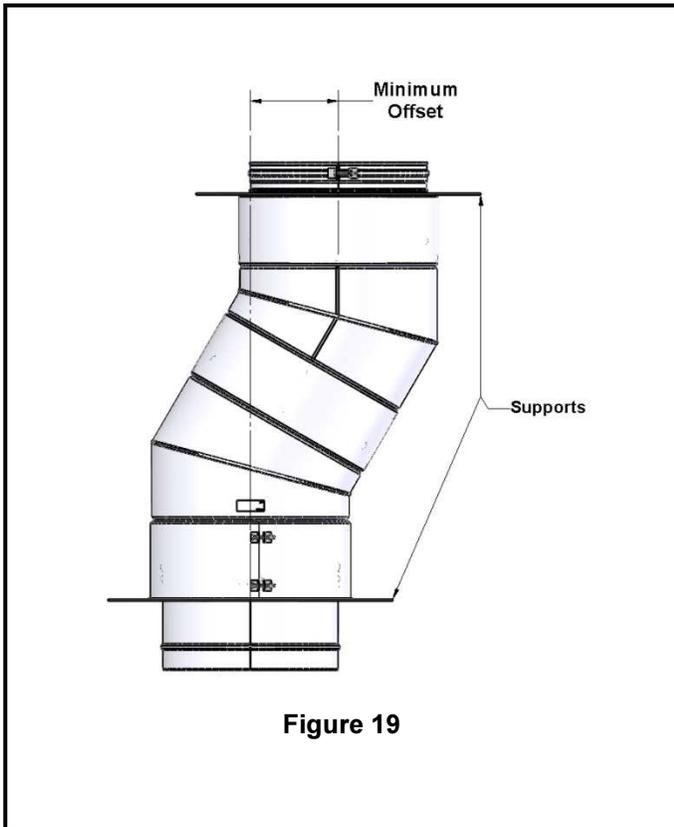


Figure 19

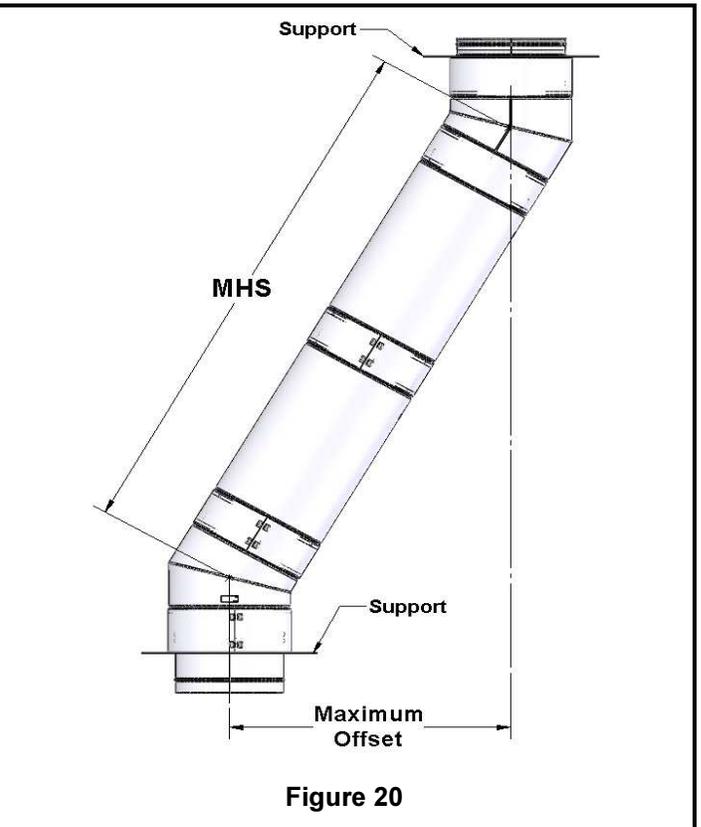


Figure 20

## Guy Wire

The Guy Wire Sections are used where the chimney extends more than 6' above the roof. For roof installations where freestanding height limits are exceeded, Rigid Roof Braces and Cable Bracings are required to resist heavy wind conditions and prevent structural damage. Each Guy Wire will allow height extension by a maximum value of 1x MVS (see Table 7). The Guy Wire Band is made to hook-up 3 guy wire (by others) at 120° apart or to be secured with Rigid Roof Brace (by others). The cables are secured to the roof by mean of tensioners (by others) and anchors (by others). Expansion joints may be required in order to minimize the effects of thermal expansion. The chimney has to be secured below the roof line with a support to maintain structural integrity as described in the **Support Methods and System Design Limits** Section. Use cables, roof anchors, braces and tensioners designed for 30 lb. per sq. ft. force on chimney projected area.

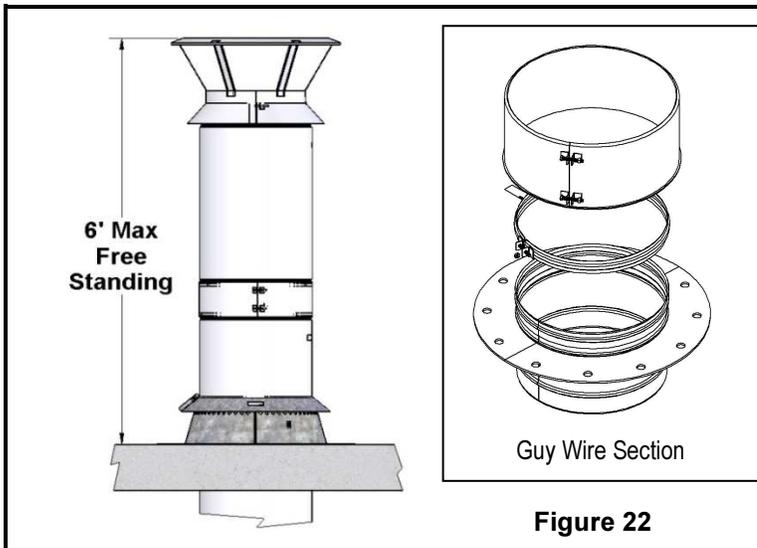


Figure 22

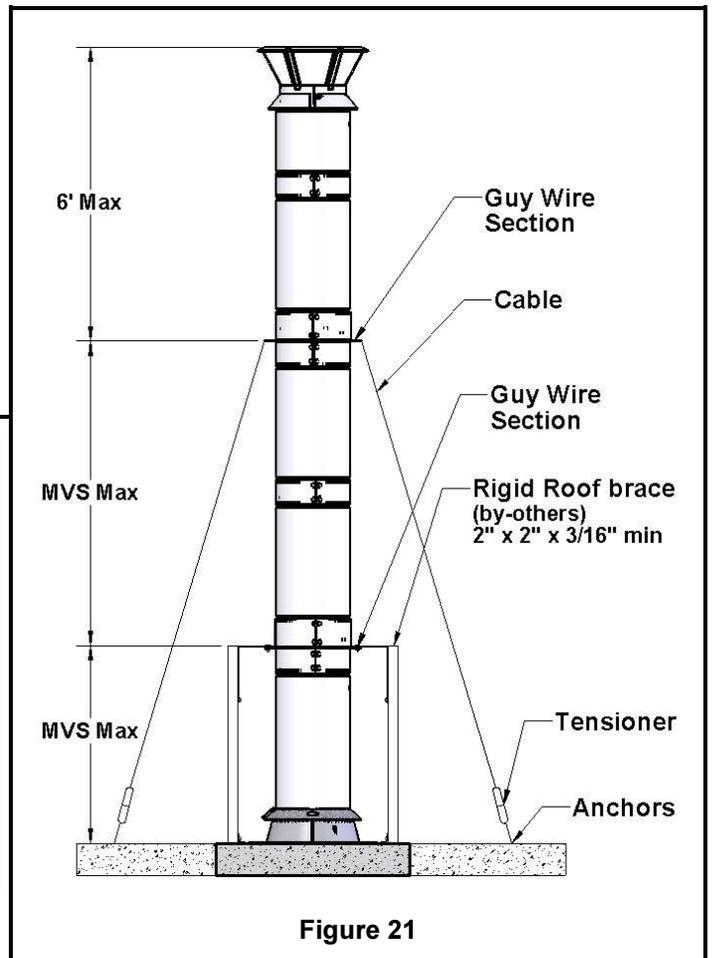


Figure 21

# Roof and Floor Penetrations

## Non-Combustibles Floor Penetration

Minimum openings when passing through a floor made of non-combustible materials such as steel structure, concrete block or other type of masonry must be at least 2" larger than the outside diameter of the chimney leaving an unobstructed gap of 1" all around the chimney. (OD + 2")

It is also required to use a Firestop combined with a Floor Guide or a Base Support in order to maintain clearance and stability. Expansion joints may be required in order to minimize the effects of thermal expansion.

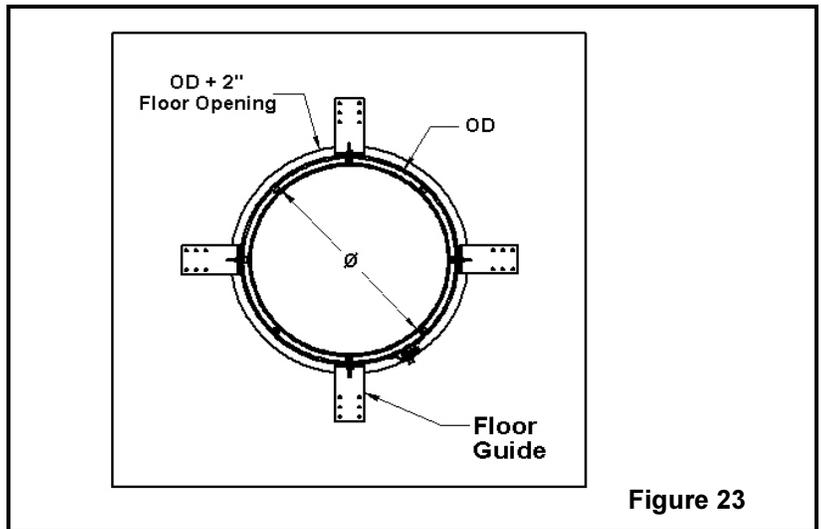


Figure 23

## Combustible Floor Penetration – 1000°F Chimney (UL 103 & ULC C-959 Listings)

\* The instructions in this section are valid for Building Heating Appliances (BHA) with venting flue gases at temperatures not exceeding 538°C (1000°F) under continuous operating conditions from gas, liquid, oil or solid fuel fired appliances. Also complies with operation (less than one hour) at temperatures not exceeding 760°C (1400°F) and brief operation (maximum 10 minutes) at temperatures not exceeding 906°C (1700°F).

An Insulated Radiation Shield must be used where a chimney passes through a floor made of combustible materials. The Radiation Shield assembly is primarily used for floor and roof penetration (see following section for roof penetration) to protect combustible materials from heat radiated from the chimney, maintain clearance and provide firestopping. See Table 8 for minimum square framing dimensions.

1. The Radiation Shield is inserted into the framing hole from under the floor and secured from under the Firestop Plate using 8 wood screws #10 x 2".
2. The Radiation Shield height can be adjusted to the floor thickness by sliding the adjustable sleeve. Excess insulation must be trimmed.
3. For minimum height adjustment remove the adjustable sleeve and trim insulation. The shield must be at least as tall as the floor thickness and cover all combustible material exposed in the floor opening.
4. Can be paired with a floor guide (above the floor) for better stability.

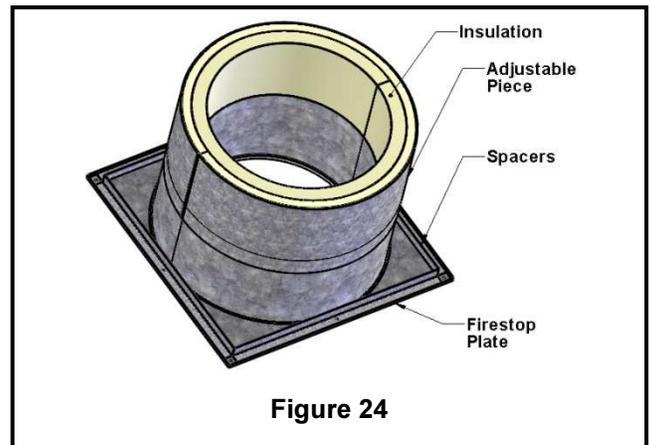


Figure 24

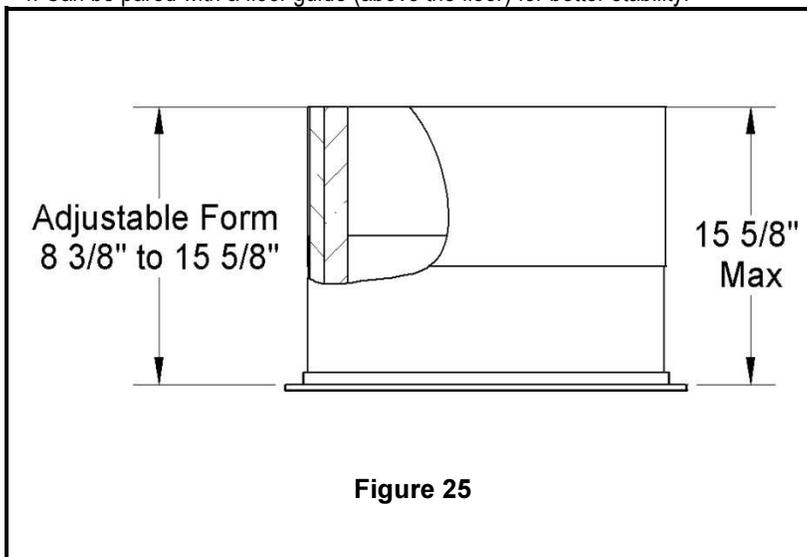


Figure 25

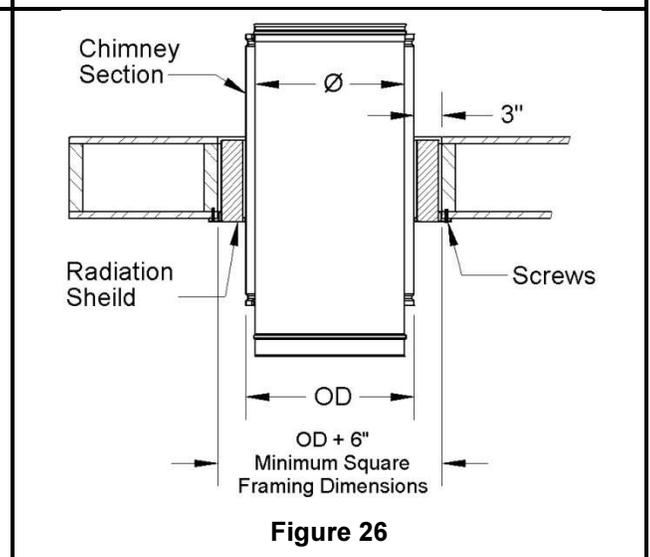


Figure 26

Table 8 - Minimum Square Framing Dimensions for Combustible Materials (Insulated and Ventilated Radiation Shields)										
Ø	6	8	10	12	14	16	18	20	22	24
VIP+ air insulated and 1" fiber (OD = ID + 2")	14"	16"	18"	20"	22"	24"	26"	28"	30"	32"
VIP+ 2" fiber (OD = ID + 4")	16"	18"	20"	22"	24"	26"	28"	30"	32"	34"
VIP+ 4" fiber (OD = ID + 8")	20"	22"	24"	26"	28"	30"	32"	34"	36"	38"

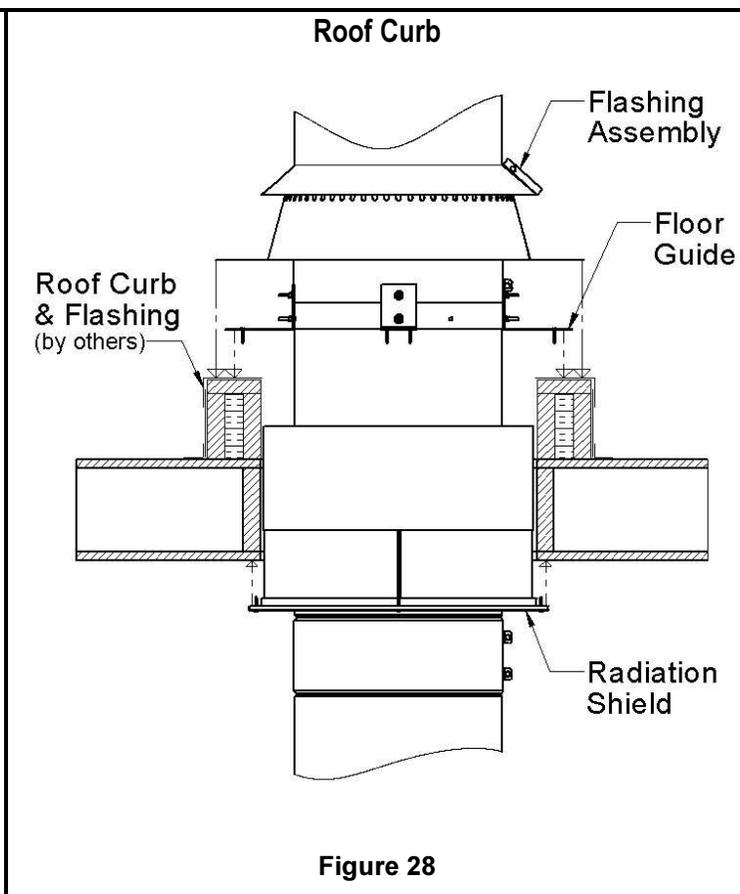
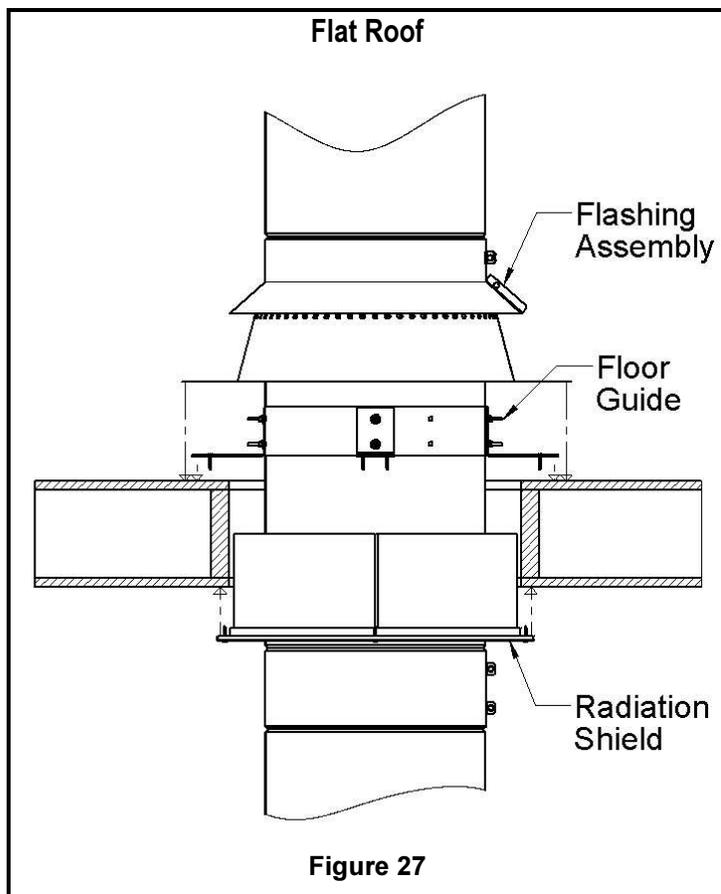
## Combustible Roof Penetration – 1000°F Chimney (UL 103 & ULC C-959 Listings)

\* The instructions in this section are valid for appliances with venting flue gases at temperatures not exceeding 538°C (1000°F) under continuous operating conditions from gas, liquid, oil or solid fuel fired appliances. Also complies with operation (less than one hour) at temperatures not exceeding 760°C (1400°F) and brief operation (maximum 10 minutes) at temperatures not exceeding 906°C (1700°F).

The Flat Roof Penetration requires the use of an **Insulated Radiation Shield**, a **Floor Guide** and a **Flashing Kit**. The Flat Roof Penetration assembly instructions are primarily used for Boiler Applications where a chimney section passes through a roof made of combustible material. It is designed to be installed on a flat roof (or roof curb) 8" to 16" high. The roof framing dimensions are presented in **Table-8** in the previous Section.

1. The Radiation Shield is inserted into the framing hole from under the roof and secured from under the Firestop Plate with 8 wood screws #10 x 2".
2. The Radiation Shield height can be adjusted to the roof curb thickness by sliding the adjustable sleeve. Excess insulation must be trimmed.
3. For minimum height adjustment remove the adjustable sleeve and trim insulation. The shield must be at least as tall as the floor thickness and cover all combustible material exposed in the floor opening.
4. The Floor Guide is secured to the top roof (or roof curb) using 4 wood screws #10 x 2" wood screws per bracket.
5. The Flat Flashing is then lowered above the Floor Guide and the Storm Collar secured to the chimney section with the screws supplied.

\* A Ventilated Roof Penetration option is also available where air circulation between the chimney and the roof structure is wanted. The Ventilated Flashing option may serve as a ventilation outlet in small boiler rooms with gravity air supply. (See **Combustible Roof Penetration - Engines (1400°F)** Section)

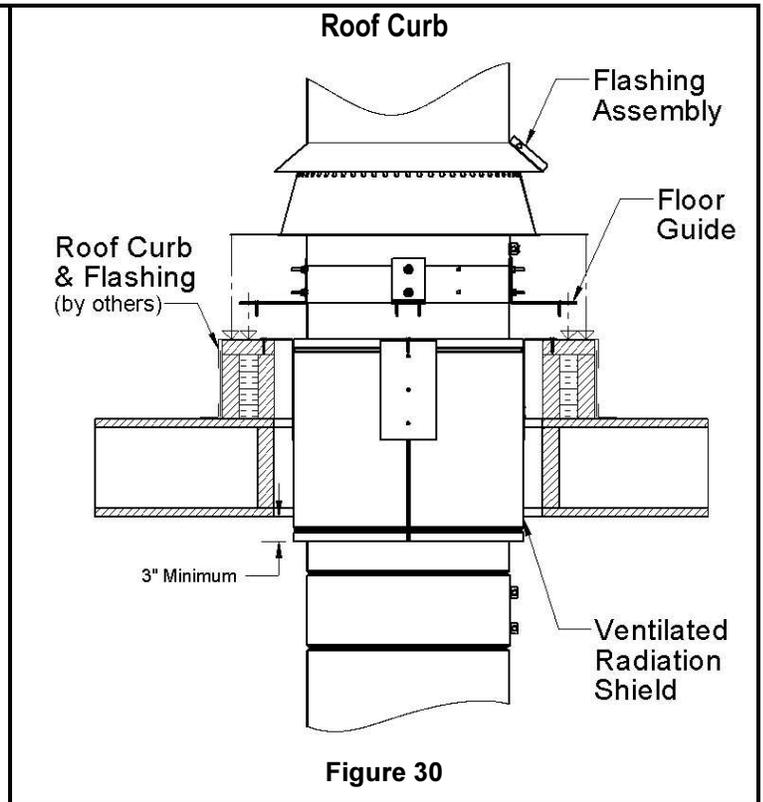
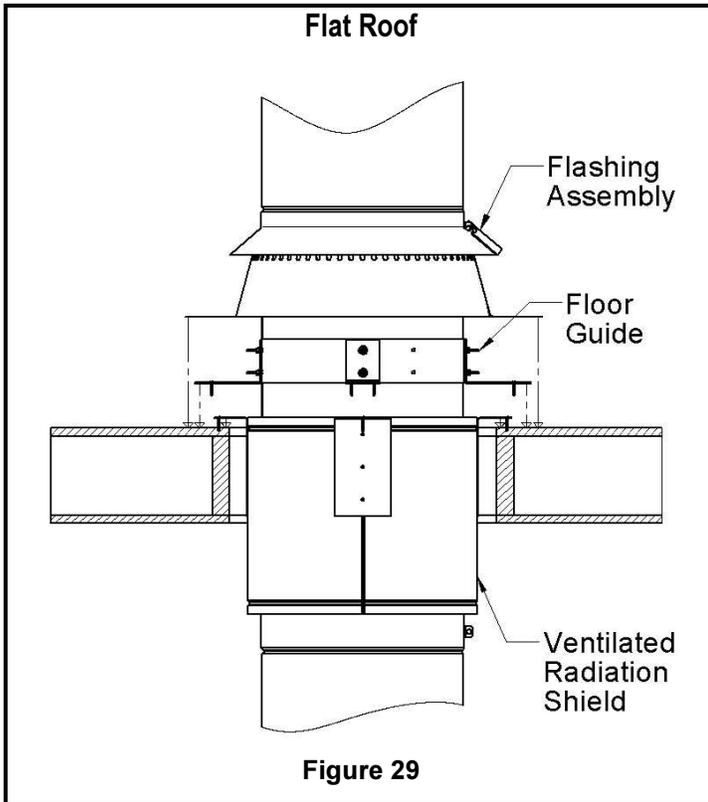


## Combustible Roof Penetration – 1400°F Chimney (UL 2561 & ULC C-959 Listings)

\* The instructions in this section are valid for appliances with venting flue gases at temperatures not exceeding 760°C (1400°F) under continuous operating conditions from gas, liquid, oil or solid fuel fired appliances. Also complies with brief operation (maximum 10 minutes) at temperatures not exceeding 906°C (1700°F).

The Flat Roof Penetration requires the use of a **Ventilated Radiation Shield**, a **Floor Guide** and a **Flashing Kit**. The Flat Roof Penetration assembly instructions are primarily used for Engines or High Temperature Applications where a chimney section passes through a roof made of combustible material. It is designed to be installed on a flat roof (or roof curb) 4" to 15" high. The Radiation shield sleeve must extend under the roof by a minimum of 3". The roof framing dimensions are presented in **Table 8** in the previous Section.

1. The Radiation Shield is inserted into the framing hole from above the roof and secured with screws on the roof top or roof curb.
2. The Floor Guide is secured to the top roof (or roof curb) using 4 wood screws #10 x 2" wood screws per bracket.
3. The Flat Flashing is then lowered above the Floor Guide and the Storm Collar secured to the chimney section with the screws supplied.



# Thermal Expansion

## General Considerations

1. When Model VIP+ is in use, thermal expansion will occur on the inner flue and outer casing.
2. A good estimation for thermal expansion is approximately 1" per 100' chimney length per 100°F of temperature rise between the flue gases and the surroundings temperatures.

$$\text{Thermal Expansion (inch)} = (\text{Length (feet)} / 100) \times (\Delta T (^{\circ}\text{F}) / 100)$$

3. Whether in the vertical or the horizontal run, the thermal expansion of the inner pipe depends on the inner flue temperature and the length of the chimney between two fixed points.
4. Good installation requires that expansion greater than 1/4" must be compensated with either a Bellow Joint or an Expansion Length. The selection of the expansion joint device depends on the system pressure\* :

\*For engine or turbine exhaust system requiring pressures up to 60 inches of water column, or where the construction must be absolutely gas tight, all Bellows Joints are recommended for expansion and vibration movements of the exhaust.

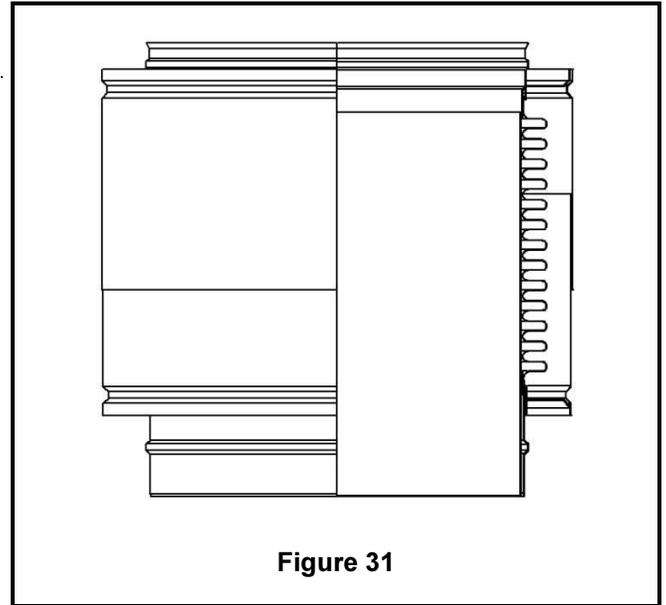
\*Low pressure systems, such as boilers (up to 6 inches water column), can effectively use the Expansion Length.

$\Delta T$ (Gas T – Surroundings T) ( $^{\circ}\text{F}$ )	Length between fixed points
200	12'6"
300	8'4"
400	6'3"
500	5'0"
600	4'2"
700	3'7"
800	3'1"
900	2'9"
1000	2'6"

5. Tees and Elbows are not designed to resist bending moment forces as a result of thermal expansion. The forces due to thermal expansion therefore need to be compensated by expansion joints.
6. Expansion joints are not designed to withstand lateral forces so they must be properly supported and guided.
7. Because the amount of outer casing movement is the same as the inner flue, the outer casing must slide to avoid excessive forces on tees, elbows or fixed points. To accommodate outer casing movements, wall guide, floor guide and suspension bands must allow movement of the chimney.
8. When re-supporting a system with considerable height and thermal expansion, Expansion Lengths or Bellow Joints must be used just below every fixed support above the first to compensate for thermal expansion.
9. Spacing of Guides and Supports, when a thermal expansion part is used, should not be greater than that specified in **table-6 and -7**.
10. Proper guiding and support of expansion parts often requires closer spacing.

## Bellows Joint

1. For exhaust pressure up to 60 inches of water column, it will compensate for up to 3" max of expansion. See **Table 10** for maximum run with one bellow.
2. Bellow Joints comes with a liner to protect the bellow and to have a smooth flow.
3. Installation is done the same way as described in the **Chimney Joint Connection** Section.
4. Bellow Joint is used for axial movements and vibration only and must be accurately supported and guided. This part has limited lateral movement. Lateral offsets and parallel misalignments should be avoided.
5. The lined bellows requires careful positioning of piping guides to avoid interference on thermal expansion.



**Figure 31**

<b>Operating temp. [°F]</b>	<b>Max distance for one bellow joint [feet]</b>
700	42.8
800	37.5
900	33.3
1000	30.0
1100	27.3
1200	25.0
1300	23.1
1400	21.4

## Expansion Length

- The expansion length is used to make odd lengths and/or to serve as an expansion joint.
- The expansion length may be used when internal pressure do not exceed 6" water column.
- The expansion length assembly contains a sliding Upper Liner Section, a Lower Liner Assembly, a Compression Band, a Graphite Packing Gasket, a flange and 2 Outside Casing Half Shields.

### Installation :

1. Install the Lower Liner Assembly into the lower pipe section. See **Chimney Joint Connection** Section for joint assembly instructions.
2. Insert the Upper Liner into the Lower Liner Assembly. Position and install the upper section and/or support that will go above the expansion length.
3. Connect the Upper Liner Section to the upper pipe section. See **Chimney Joint Connection** Section for joint assembly instructions.
4. Position the Graphite Gasket on the Lower Liner's flange all around the Upper Liner section and secure with the Compression Band.
5. Insert the top Flange and trap the Graphite Gasket between the two flanges and secure with the supplied bolts. Use a star tightening pattern of the bolts for better stability. Re-tighten the compression band bolt if necessary.
6. Install Insulation Pad (if necessary) and cover with 2 Outer Casing Half Shields screwed into each other. Outer Shields may be cut to length if required.

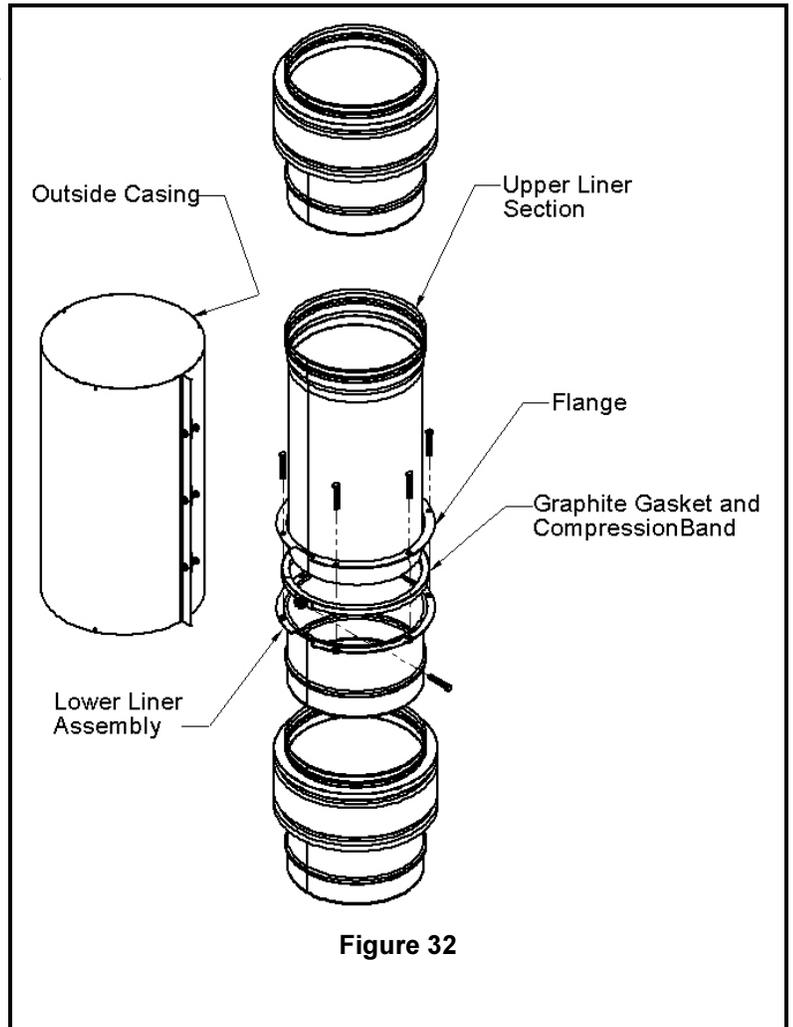


Figure 32

For proper installation, the Expansion Length must have adequate overlap and sufficient allowance for thermal expansion (see Dimension X in **Figure 33**). The Minimum overlap between Upper and Lower Liner Sections is 2 inches.

Care must be exercised so that proper penetration is maintained at low temperatures and no interference occurs at high temperatures. The minimum distance for thermal expansion allowance (dimension X in Figure 33) will change depending on distance between two fixed points (supports) and the operating appliance gas temperatures. Make sure that that dimension X is sufficient to prevent interferences.

Calculation example :

For a section of chimney of 100 feet with operating gas temperature of 800°F (and ambient Temp. of 70°F) use the following thermal expansion equation

$$X = ( \text{Length (feet)} / 100 ) \times ( \Delta T (^\circ\text{F}) / 100 )$$

$$X = ( 100' / 100 ) \times ( ( 800^\circ\text{F} - 70^\circ\text{F} ) / 100 )$$

$$X = 7.3 \text{ inches}$$

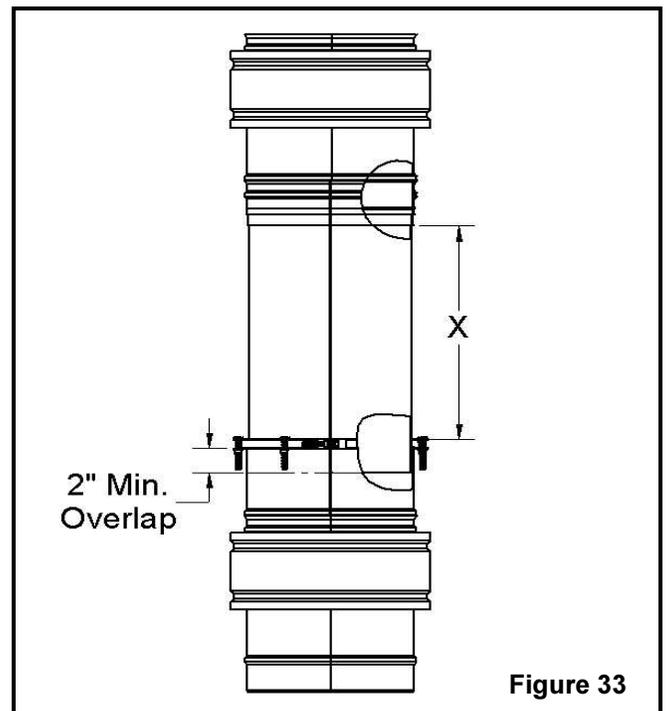


Figure 33

## Expansion Joints Installation

### Bellows Joint and Expansion Length in vertical runs

1. A Bellows Joint or Expansion Length installed vertically should be installed directly below the highest support or one pipe length below, between fixed points. See **Figure 36 - 37**
2. Always use Bellows Joints or Expansion Lengths between fixed points when expansion is over 1/4". See **Table 6 and 7** for maximum run between fixed points.
3. Install proper guiding between fixed points when using Bellows Joints or Expansion Lengths, to allow chimney vertical movement due to expansion.

### Bellows Joint and Expansion Length in horizontal runs

1. Same guidelines apply as for vertical run with respect to expansion estimate and proper support and guiding with the use of Bellows Joints or Expansion Lengths. See **Figure 36 - 37**

## Adjustable Lengths

The Adjustable Lengths (A1 and A2) serves two major functions: 1) to make up for odd lengths of pipe in short runs, and 2) to provide for joint sealing. This part adjusts to a needed fixed exact length. Its internal joint must be sealed by working sealant under the compression band, as well as between the flanges to be secured by bolts. Observe all precautions for cleaning sealed surfaces and use proper sealant as described in the **Sealant Application Chart** section (see **Table 4**). It can be used in horizontal or vertical runs and also between elbows. This part does not serve as an expansion joint.

### Installation :

1. Install the Lower Liner Assembly into the lower pipe section. See **Chimney Joint Connection** Section for joint assembly instructions.
2. Position the Compression Band and Flange around the Upper Liner Section
3. Insert the Upper Liner Section into the Lower Liner Assembly. Position and install the upper part (Length, elbow, support, etc) that will go above the adjustable length.
4. Connect the Upper Liner Section to the upper pipe section. See **Chimney Joint Connection** Section for joint assembly instructions.
5. Apply 2 beads of sealant all around the upper liner section. The first one 1" above the bottom flange and the second right where the inner liner meets the lower flange (see **Figure 35**)
6. Slide the compression band in its place over the first bead of sealant. Tighten the flanges with the supplied bolts. Use a star tightening pattern of the bolts for better stability. Tighten the compression band bolts. Do not remove the excess of sealant.
7. Install Insulation Pad (if necessary) and cover with 2 Outer Casing Half Shields screwed into each other. Outer Shields may be cut to length if required.

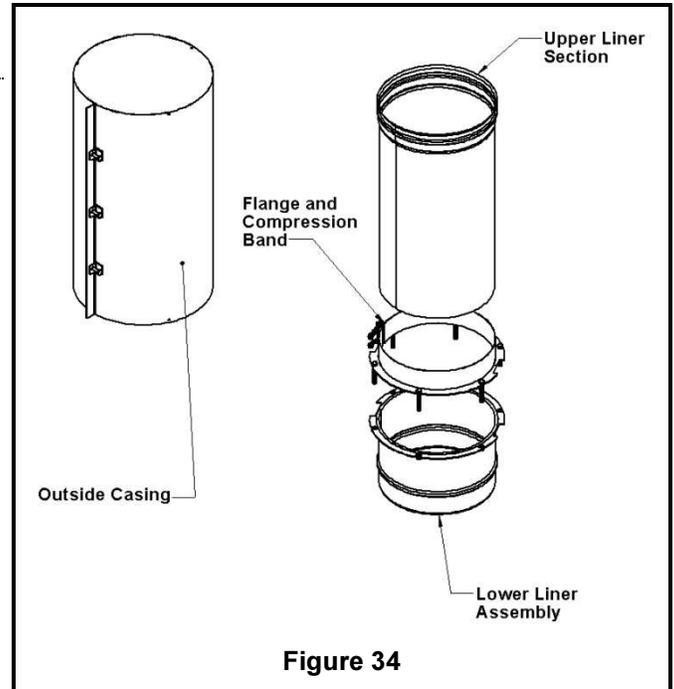


Figure 34

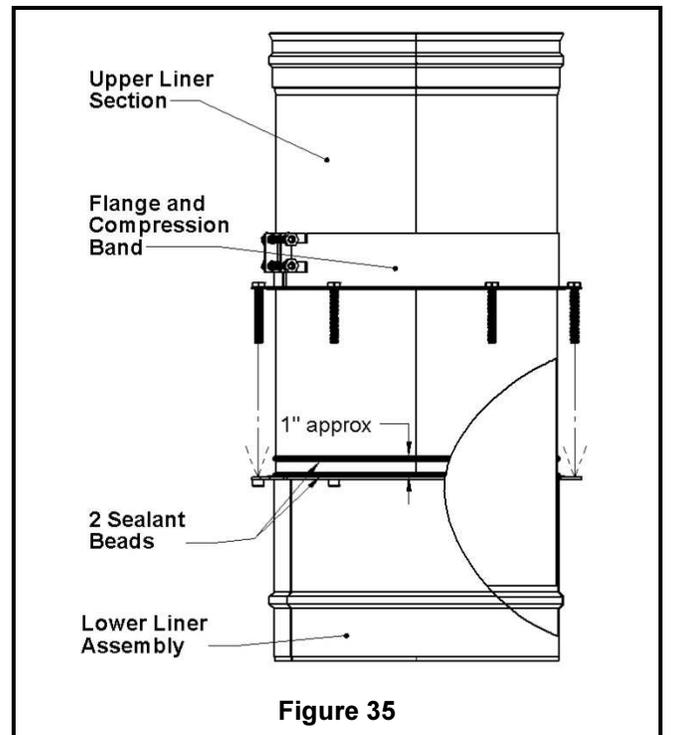


Figure 35

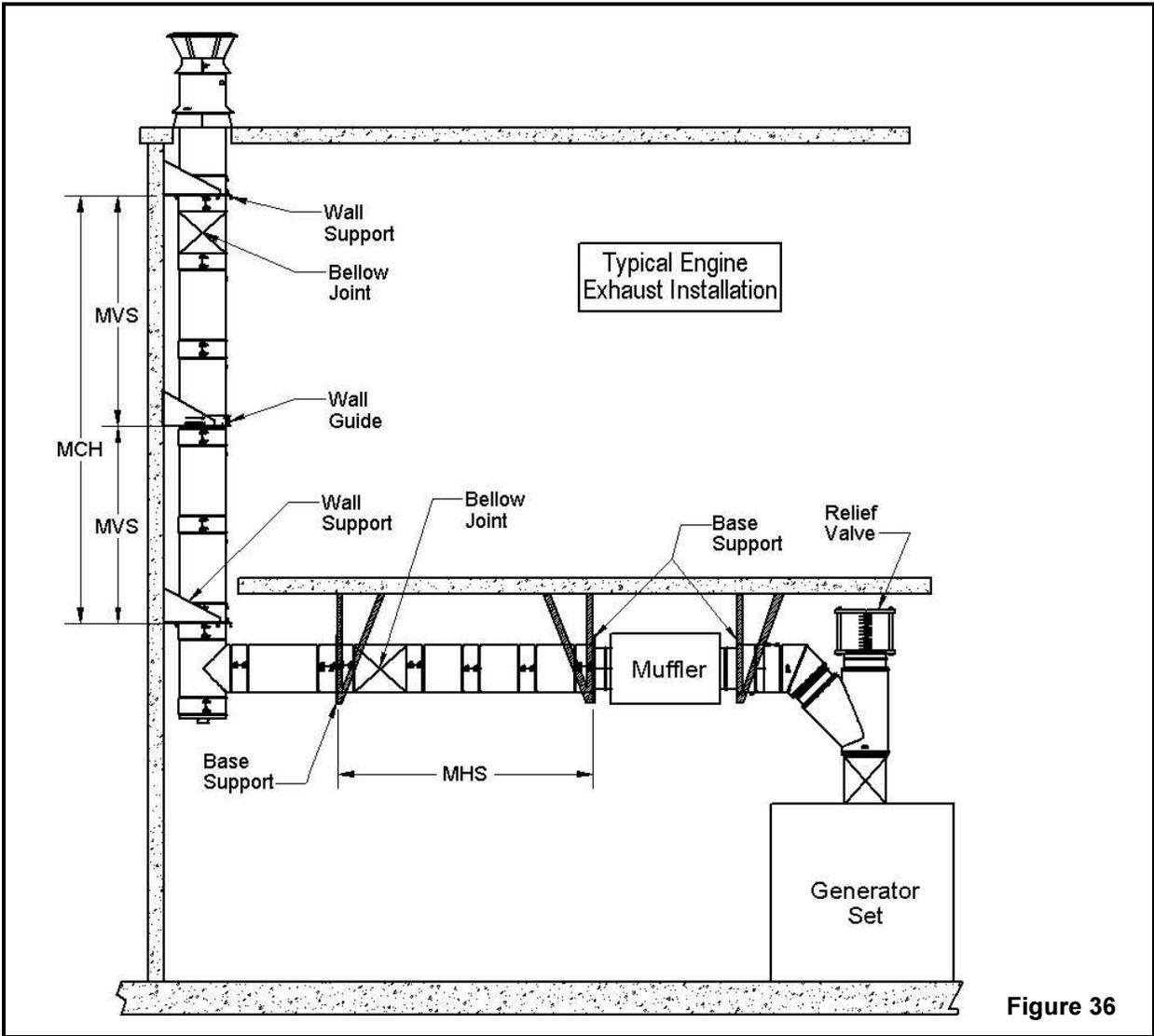
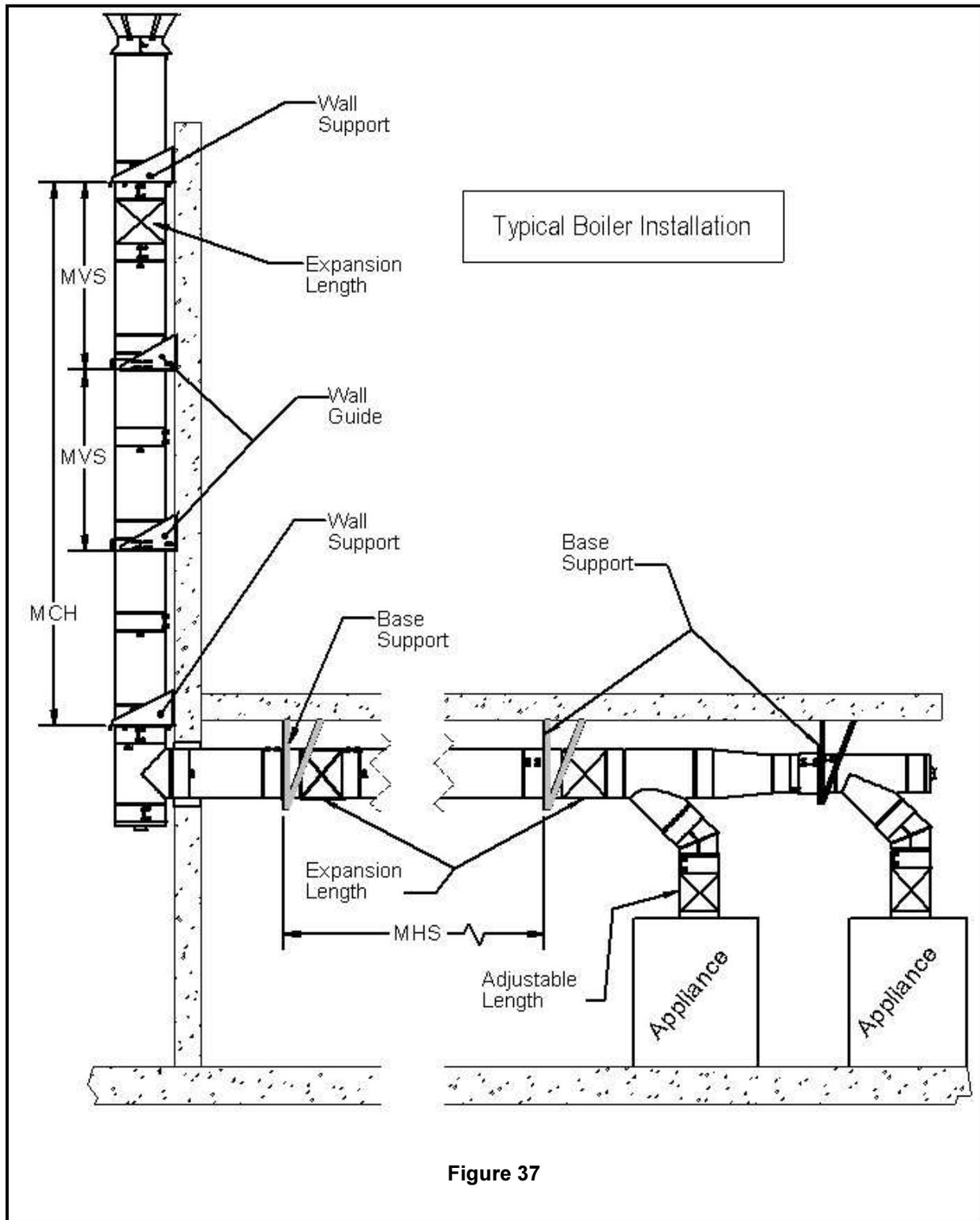


Figure 36



# Grease Duct

## Listings and Applications

The ICC model VIP+ double wall is listed as grease duct for continuous temperature of 500°F (260°C) and intermittent temperatures of 2000°F (1094°C). For use in commercial cooking installations for the removal of smoke and grease laden vapors. Installation is made in accordance with these installation instructions and National Fire Protection Association standard “NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations.”

Models VIP+ (air insulated, 1", 2" and 4" fiber insulated) are listed by Underwriters laboratories (UL) under Listing # MH16722 and tested in accordance with UL 1978 Standard for Grease ducts and ULC-S662 Standard for factory built Grease ducts. They are intended for use as complete systems that can be connected to hoods, grease extractors, up-blast exhausters, in-line or utility fans used in restaurants, hotels and other food service applications.

Grease duct system sizing information is available from the “ASHRAE Handbook – Fundamentals” or from the “Air Pollution Engineering Manual” of the “US Environmental Protection Agency.”

## Clearances and Surroundings

VIP+ grease duct is primarily intended for use in non-combustible surroundings or in unenclosed installations.. When installed in an open room where enclosure is not required, VIP+ grease duct may be located at clearance to combustibles in accordance with **Table 11**. The ducting may be located in a corner formed by two walls of combustible construction when minimum clearances are respected. A grease duct penetrating a ceiling, floor or wall which does not have a fire resistance rating does not require to be enclosed, when installed at the correct minimum clearances for unenclosed duct.

Flue Ø	VIP+ Model	
	VIP+ air insulated	VIP+ 1", 2" and 4" fiber insulated
Ø6" to 20"	10"	4"
Ø22" to 24"	14"	6"

Where a grease duct penetrates a wall or ceiling rated for fire resistance, the duct shall be enclosed with a continuous enclosure extending from the penetration, through any concealed spaces, to or through the roof so as to maintain the integrity of the fire separations required by the applicable building code. The enclosure shall be sealed around the duct at the point of penetration of the fire-rated ceiling or floor above the hood, in order to maintain the fire resistance rating of the enclosure. The enclosure shall be extended to the exterior of the building through weather sealed openings. When a building is less than 4 stories in height, the enclosure shall have a fire resistance rating of not less than 1 hour. For buildings that are 4 stories high or more, the enclosure shall have a fire resistance rating not less than 2 hours.

Grease ducts may penetrate a floor or roof made of combustible material using either the **Insulated Radiation Shield and Floor Guide (and flashing for roof)** assembly or the **Ventilated Radiation Shield and Floor Guide (and flashing for roof)** assembly. See the **Roof and Floor Penetrations** Sections of this document for detailed installation instructions. These are the only parts intended for use with combustible construction. All other parts such as Supports and Guides are for attachment to non-combustible construction.

## General Installation Instructions

1) Chimney joint connection and sealing methods for Grease Ducts are the same as boilers and/or engine applications. Both methods can be used to seal the VIP Grease Duct (Low temperature 600°F max and High temperature above 600°F applications) Refer to **Chimney Joint Connection** Section of this manual for detailed instructions. Adjustable lengths may also be used to properly match odd lengths, see **Adjustable Lengths** Section.

2) Install at a slope not less than one-fourth unit vertical in 12 units horizontal toward the hood or toward a grease reservoir (1/4" per foot of slope). Where horizontal ducts exceed 75 feet in length, the slope shall be not less than one unit vertical in 12 units horizontal (1" per foot of slope). Some local building codes may require more slope in horizontal runs please check with local authorities.

3) Chimney supporting and guiding methods are the same as boilers applications. See **Structural Supports and Guides** section of this documents for installation Instructions.

## Fan Adapter

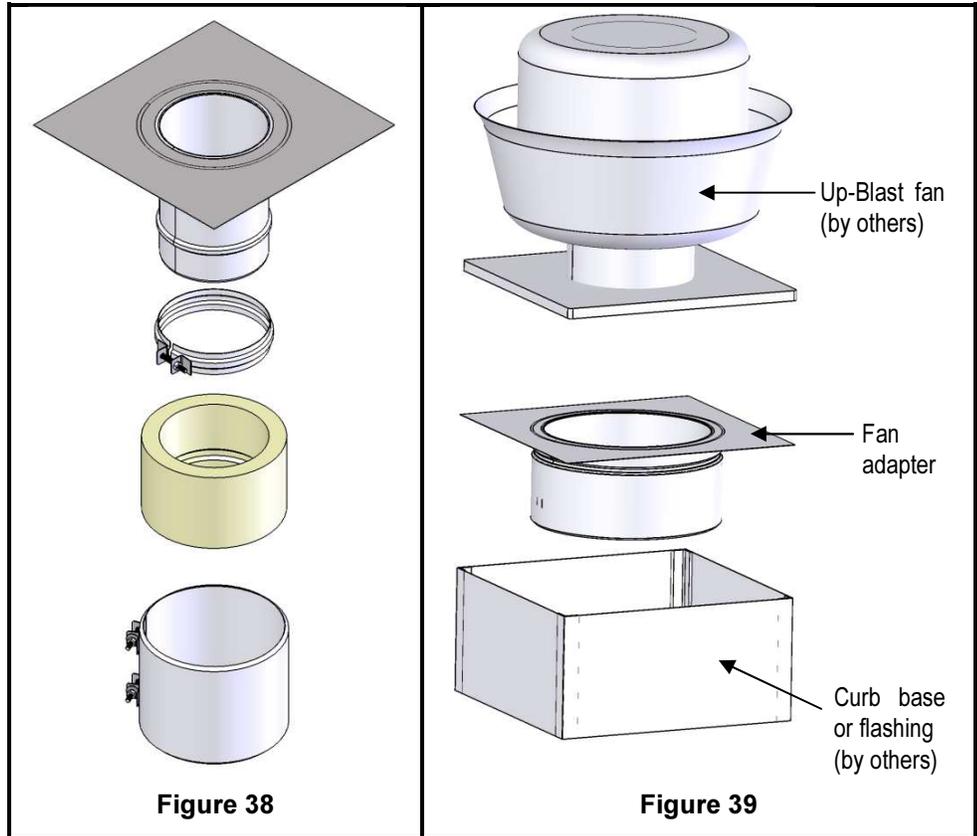
The Fan Adapter (**Figure 38**) is generally used to connect an up-blast fan installed on a roof curb or a site built support structure.

The size of the plate can be customized to fit the fan and/or roof curb. When connected to an up-blast fan (**Figure 39**), the plate mounts on top of the roof curb which supports the fan assembly.

The fan adapter can also be used to connect to other types of device such as in-line fans, side wall exhaust fans or utility fans which are also used in commercial cooking applications.

The Fan Adapter is attached and sealed to other pipe sections in the same manner as described in **Chimney Joint Connection Section**.

Specify outside plate dimensions when ordering the Fan Adapter.



## Nozzle Length and Drains

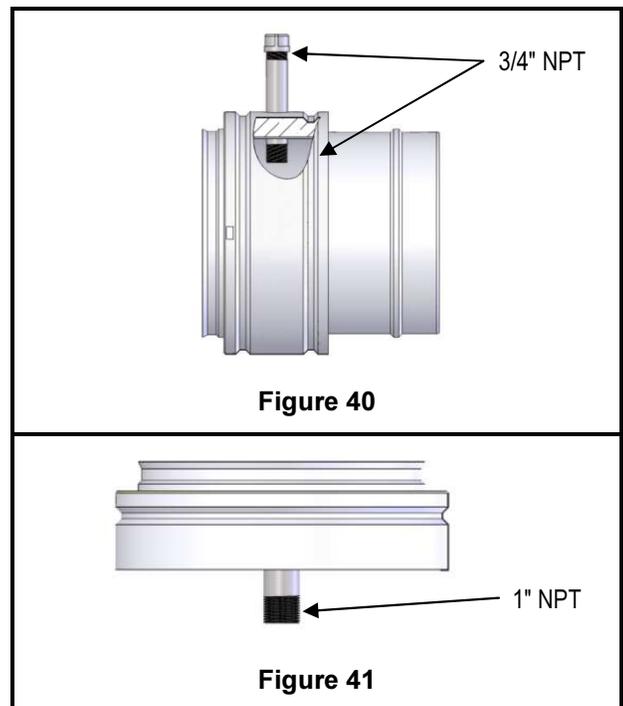
The Nozzle Length (**Figure 40**) can be used as a port section in boiler applications for taking draft and temperature measurements while setting up the boilers. It may also be used to integrate automatic cleaning or fire suppression devices (by others) to a Grease Duct installation.

The Nozzle Length comes with a 3/4" NPT nipple (both ends) that can be connected to an automatic water/detergent injection cleaning system which may be required for some projects.

It's also intended for connecting devices such as CO2 extinguishing systems (NFPA 12), sprinkler systems (NFPA 13), foam-water sprinkler systems (NFPA 16), or dry chemical extinguishing systems (NFPA 17) where jurisdictions require additional fire suppression.

Drain Sections (horizontal and vertical) and Drain Tee Caps (**Figure 41**) are also available to collect rainwater and condensation, or to collect water from the cleaning process. Drain Tee Caps may also be used to drain grease when attached to a Tee installed at the base of a rise. All drains are equipped with a 1" NPT male nipple to be connected to a suitable disposal system.

Nozzle Lengths and Drains are attached and sealed to other pipe sections in the same manner as described in **Chimney Joint Connection Section**.



## Cleanout and maintenance

Grease duct is required by NFPA 96 and many local building codes to be inspected and cleaned (if necessary) at specific intervals. VIP+ Grease Duct must be inspected and cleaned in accordance with local requirements. It requires no additional internal maintenance. \*Canadian regulation requires that an access opening shall be provided on each section of horizontal duct for duct cleaning. The access opening shall be minimum 505 mm (20") by 505 mm (20"). Where the duct size is such that the opening is not possible, openings large enough to permit thorough cleaning shall be provided at least every 3.7 m (12ft).

ICC recommends that grease containers connected to drainage points be emptied and washed out daily or more often, if necessary. If needed, the drain nipples should be checked and cleaned whenever the containers are emptied.

Where the duct is installed outside the building, the Galvalume steel outer casing must be primed and painted. The paint surface should be maintained regularly to prevent possible deterioration of the casing surface. The use of stainless steel outer casing negates the need for painting.

### Creosote and Soot – Formation and Need for Removal (For pizza oven and other solid fuel cooking devices)

When wood is burned slowly, it produces tar and organic vapors which combines with expelled moisture to form creosote. The creosote vapors condense in the relatively cool grease duct of a slow burning fire. As a result, creosote residue accumulates on the duct. If ignited, this creosote makes an extremely hot fire. For this reason, the duct should be inspected at least once every two months to determine if a creosote or soot buildup has occurred. Consult local code and officials as they might require more frequent intervals. If creosote or soot has accumulated, it should be removed to reduce risk of fire.

A licensed or qualified grease duct cleaner should be contacted to clean the duct. Contact local building or fire officials about restrictions and installation inspection in your area. Adequate clearance is required around cleanouts to assure accessibility for removal of caps and products accumulated within the grease duct.

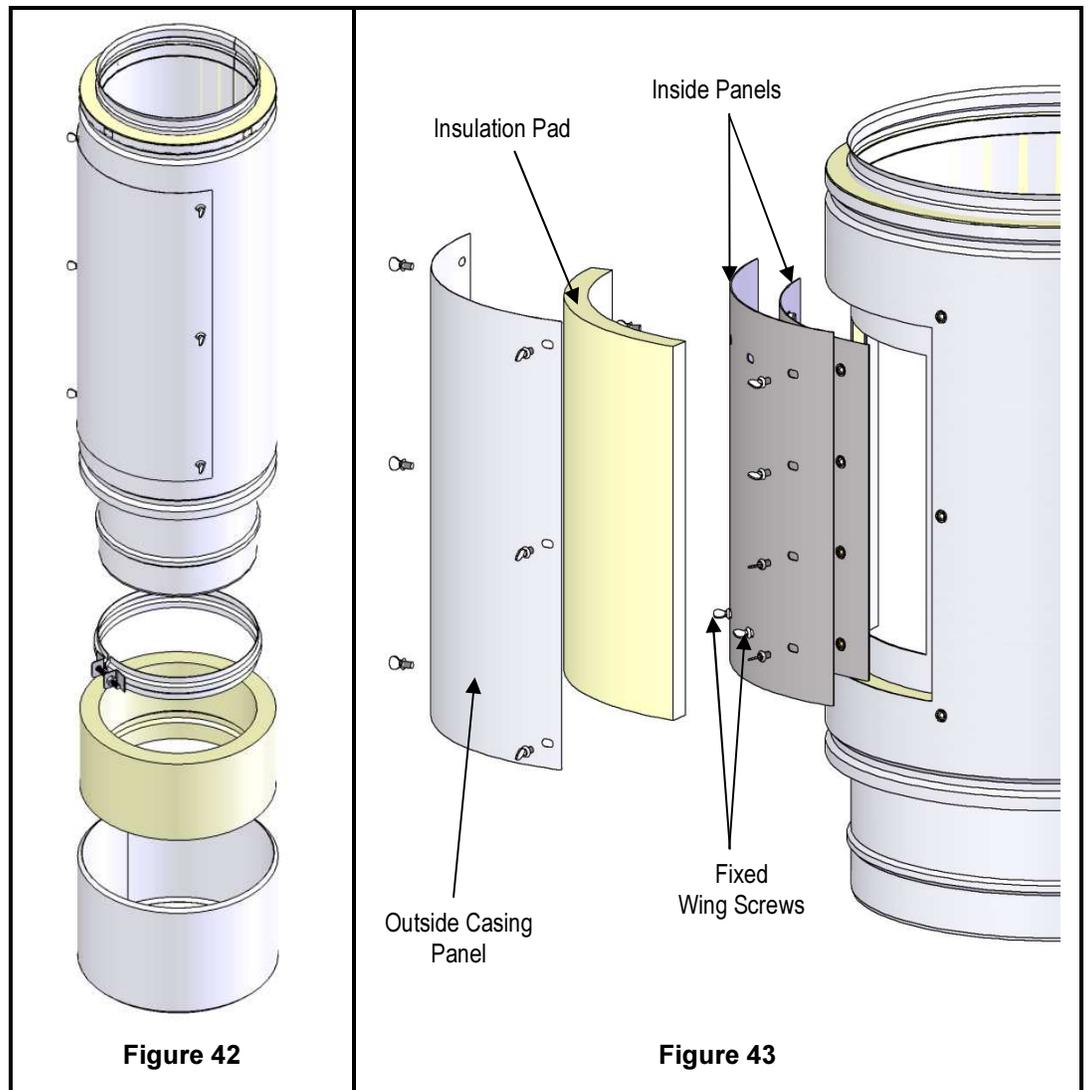
### Access Door Section

The Access door section (**Figure 42** and **Figure 43**) is installed in line with the pipe to provide an inspection and cleaning access point. It doesn't require specific tools since the access panels (both outside casing and flue) are secured with thumb screws. The Access Door section comes pre-assembled from the factory.

The flue panels can be accessed after removal of the outside casing door and insulation pad (for insulated Grease Ducts). To remove the outside panel, unscrew and remove all the thumb screws.

The inside access door is made of 2 panels. The outside flue panel is screwed into a smaller panel that fits inside the flue. To remove, unscrew all thumb screws. The 2 bottom middle screws can be loosen but can't be removed. This allows the 2 plates to remain joined together but gives enough clearance to pull the inside panel out of the flue opening.

The Access Door is attached and sealed to other pipe sections in the same manner as described in **Chimney Joint Connection Section**.



## Wyes and Tees (Cleanout)

Special care must be taken when designing a Grease Duct to provide access for cleanout and comply with NFPA 96 requirements.

Inspection and cleanout points can be equipped with a dam at the access port. The access port must be closed with a tee cap and the grease dam prevents grease spillage when opened. The location of the access port in the tee is dependent on the orientation of the tee in the final installation. Two types of tees are available to cover all possible configurations and insure that a grease dam can always be properly positioned.

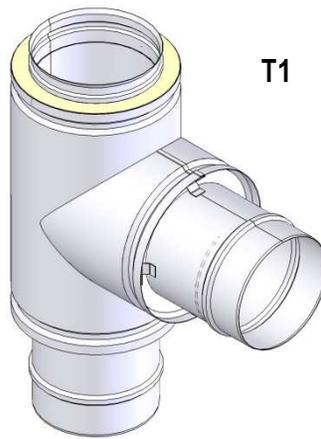


Figure 44

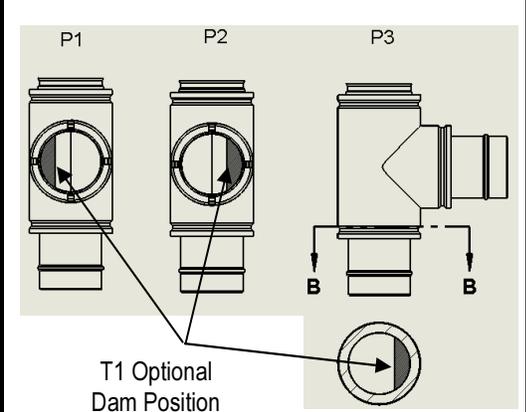


Figure 45

1) **T1 Grease Tee (Figure 44)** is your basic 90° Tee fitted with a grease Dam. Refer to **Figure 45** for dam position.

2) **T2 Grease Tee (Figure 46)** has inverted female and male ends and covers mostly horizontal grease dam configurations. Refer to **Figure 47** for dam position.

When ordering you GreaseTee, please specify tee type (T1 or T2) and dam position (P1, P2 or P3)

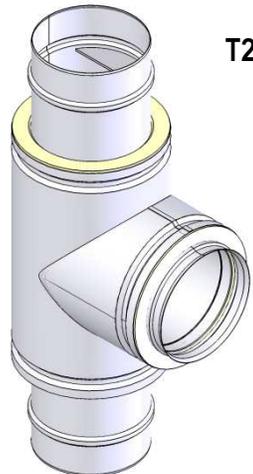


Figure 46

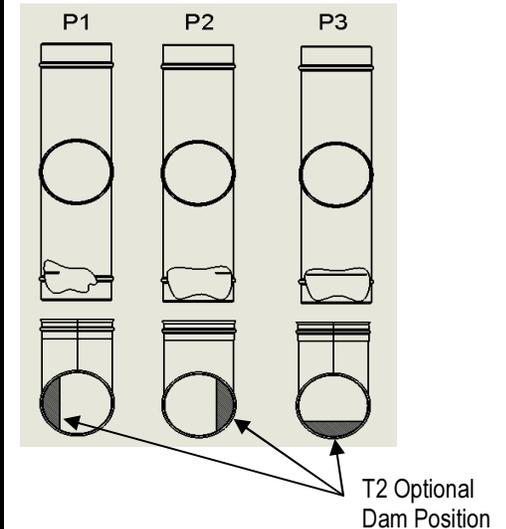


Figure 47

The Grease Duct Wye (Figure 48) is useful where the grease duct must be accessed for clean-out and inspection purposes. It can be used in place of the T1 and T2 Grease Tee and combined with a Tee Cap to provide easy access clearance at the end of an horizontal run. See Figure 49 for typical installation.

The wyes and tees are attached and sealed to other pipe sections in the same manner as described in **Chimney Joint Connection Section**.

A No-Tool Tee Cap is available to facilitate access for inspection and cleanout.

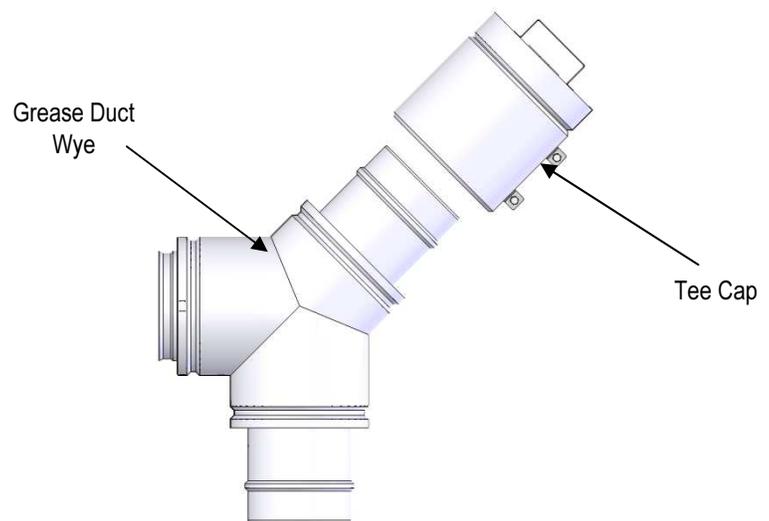


Figure 48

# Typical Grease Duct Installation

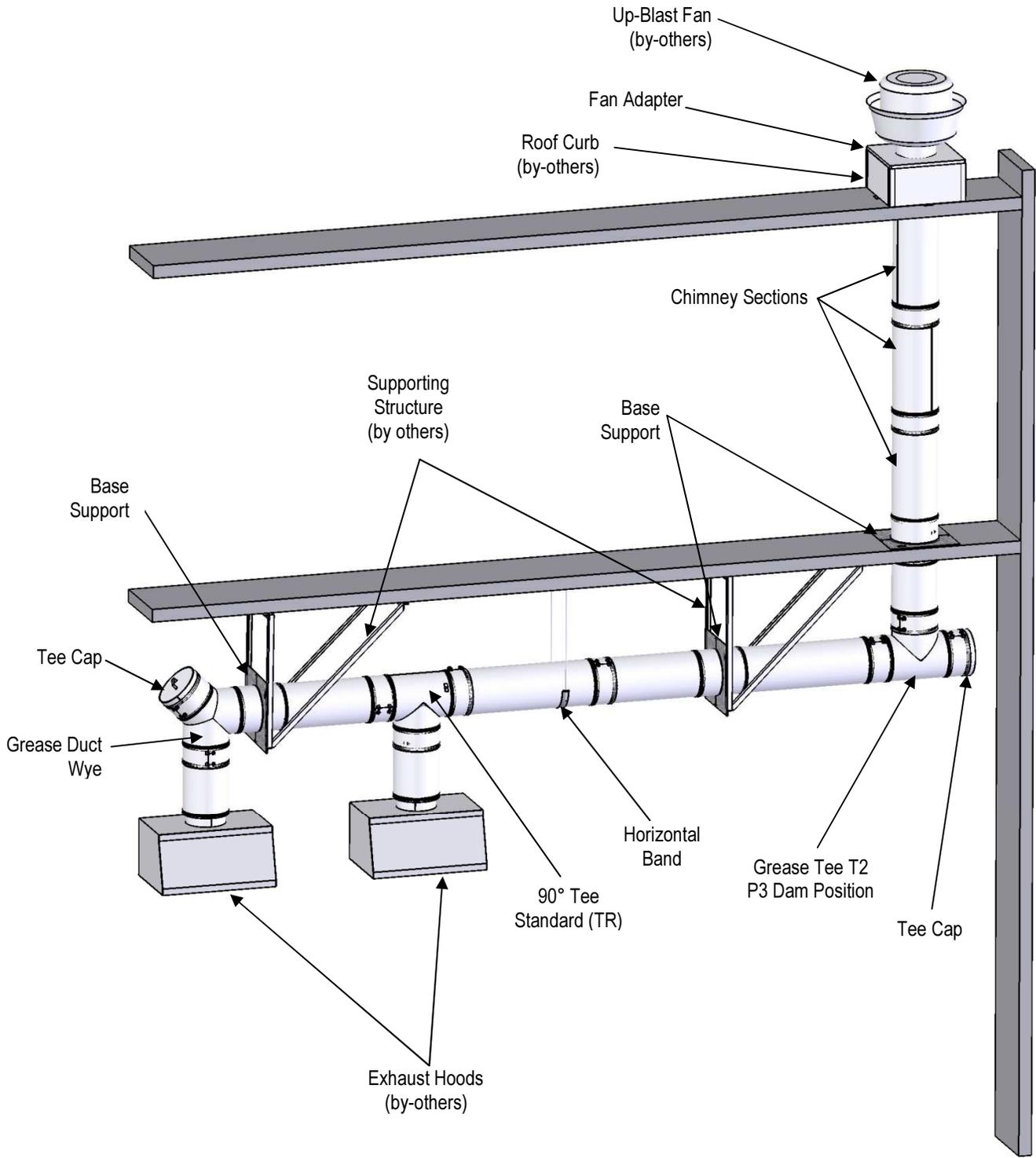


Figure 49

# WARRANTY

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## LIMITED 10 YEAR WARRANTY

ICC warrants its Model VIP+ vent to be free of defects in materials and workmanship for a period of ten years from the date of purchase from ICC. This ten year warranty will only apply to systems which meet the following criteria:

The complete system must have been designed and sized by ICC engineers and all pertinent design and operating parameters of the system must have been accurately represented to ICC.

The entire vent system, including breeching as required, must have been supplied by ICC. Systems partially supplied by ICC do not qualify under this warranty.

The system must be installed in accordance with the installation instructions provided.

Proper precautions have been taken to insure that the combustion air is free of solvent or refrigerant vapors as well as any compounds which may cause acid condensates to form.

All exposed galvalume, galvanized, or steel surfaces must be protected at all times by a minimum of one base coat of primer and one finish coat of heat resistant and corrosion resistant paint. Stainless steel surfaces need not be primed or painted.

## WARRANTY STIPULATIONS

Remedies under the one year and ten year warranties are strictly limited to repairing or replacing, at ICC's option, any components which are determined by ICC to be defective. The warranties do not cover any labor costs or freight charges. Any parts returned to ICC under terms of the warranties must be returned freight prepaid.

ICC shall not be liable for incidental or consequential damages of any kind or for any damages resulting in whole or in part from misuse, improper installation, or inadequate maintenance of the system. In no event shall ICC be liable for any costs of installation, removal or replacement. No agent is authorized to make any modifications to this warranty or offer any additional warranties of any kind on behalf of ICC.

In all cases the system must be examined by a factory authorized representative in order to determine liability under this warranty.